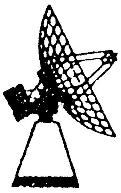
NEC VHS PAL

MODEL N895EG

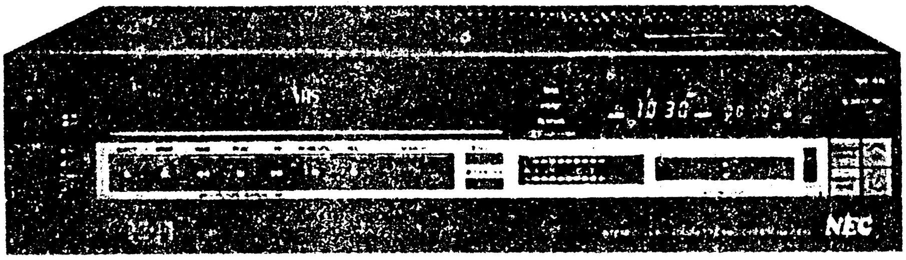
COLOUR VIDEO CASSETTE RECORDER

SERVICE MANUAL

ORDER NO. 549910278



Better Service
Better Reputation
Better Profit



SPECIFICATIONS

Format	VHS PAL standard with Hi-Fi audio
Video recording system	Rotary, two-head helical scan system with slant double-azimuth combination video heads
Hi-Fi audio recording system	Deep-layer recording system conforming to stereo Hi-Fi VHS standard
No. of audio channels	2 Hi-Fi audio channels 2 normal audio channels
Video signal system	PAL colour and CCIR monochrome signals, 625 lines
Tape width	12.65 mm
Tape speed (SP)	23.39 mm/sec ±0.5%
(LP)	11.70 mm/sec ±0.5%
Maximum recording time (SP)	240 min. with E-240 video cassette
(LP)	480 min. with E-240 video cassette
Temperature	
Operating	5°C to 40°C
Storage	-20°C to 60°C
Power requirement	220V ~, 50/60 Hz
Power consumption	40W (50W with camera)
Camera connector output	12V ---, Max. 8W
Video	
Input	0.5 to 2.0 Vp-p, 75 ohms unbalanced
Output	1.0 Vp-p, 75 ohms unbalanced
Signal-to-noise ratio	43 dB (Rohde & Schwarz noise meter) with PICTURE SHARPNESS control at centre position
Horizontal resolution	250 lines with PICTURE SHARPNESS control at centre position
Audio	
Input	Mic: -67 dBs, high impedance, unbalanced AUDIO LINE IN connector (RCA × 2) -20 dBs, 50 k-ohms, unbalanced AUDIO/VIDEO socket (21-pin): -8 dBs, 50 k-ohms, unbalanced
Output level	AUDIO/VIDEO socket (21-pin Peri connector): 0 dBs, high impedance load MIXED AUDIO OUT connector (RCA × 2): -6 dBs, high impedance load
Output impedance	Less than 1 k-ohm, unbalanced
Signal-to-noise ratio	More than 40 dB (Dolby NR on)
Frequency range	70 Hz to 10,000 Hz
Hi-Fi audio	
Output level	Hi-Fi AUDIO OUT connector (RCA × 2): -6 dBs, high impedance load
Frequency response	20 Hz – 20,000 Hz
Dynamic range	More than 80 dB
Wow and flutter	Less than 0.005% WRMS
TV tuner/RF section	
Channel storage capacity	32 channels
Aerial input	VHF band I, 47 – 118 MHz VHF band III, 118 – 300 MHz UHF band IV/V, 470 – 862 MHz
Aerial output	UHF channels 32 – 40 (Adjustable)
Digital clock/timer	
Clock display	24 hour flouorescent digital display with day indication
Reference frequency	Quartz controlled
Start time setting	Within 2 weeks
Programming capacity	8 programmes
Dimensions	435 mm (W) × 105 mm(H) × 379 mm(D)
Weight	9.4 kg
Provided accessories	Aerial cable, Cassette tape E-30 Infrared remote control RB-85EG, "R6"-size battery × 2, Audio cable (RCA-RCA)

Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.

NEC Corporation
TOKYO, JAPAN

SECTION 4
CHARTS AND DIAGRAMS

4.1 KEY TO ABBREVIATIONS

A
AC : Alternating Current
ACC : Automatic Color Control
A/CTL : Audio/Control
ADD : Adder
ADC : Analog to Digital Converter
ADJ : Adjustment
A DUB : Audio Dub
AE : Audio Erase
AEF : Automatic Editing Function
AFC : Automatic Frequency Control
AFT : Automatic Fine Tuning
AGC : Automatic Gain Control
AH : Audio Head
AHD : Audio High Density
AL : After Loading
ALC : Automatic Ligh Compensation
Automatic Level Control
A/S/M : Audio/Servo/Mechacon
ALM : Alarm
ALU : Arithmetic Logic Unit
AM : Amplitude Modulation
AMP : Amplifier
ANT : Antenna
APC : Automatic Pedestal Control
Automatic Phase Control
APL : Average Picture Level
ASS'Y : Assembly
ATT : Attenuator
AUTO : Automatic
AUX : Auxiliary
AUD : Audio

B
B : Base
BAL : Balance
BATT : Battery
BBD : Bucket Brigade Device
BCD : Binary Coded Decimal
BEG : Beginning
BFP : Burst Flag Pulse
BUFF : Buffer
BIT : Binary Digit
BLK : Black
BLU : Blue
BNC : Bayonet Connector
BOT : Beginning of Tape
BPF : Bandpass Filter
BRK : Brake
BRN : Brown
BRT : Brightness
BT : Band Tuning
BW or B/W : Black and White

C
C : Capacitance
CAP : Capstan
CAR : Carrier
CASS : Cassette
CCD : Charge Coupled Drvice
CCT : Circuit
CdS : Cadmium Sulphide
CD : Countdown
CF : Ceramic Filter, Color Frame
CC : Cassette Compartment
CE : Chip Enable
CH : Channel
CHG : Charge
CHROMA : Chrominance
CLK : Clock
CLR : Clear
CMOS : Complementary Metal Oxide Silicon
CMD : Command
CNT : Count, Counter
CONV : Converter
COL : Color
COM : Common
COMB : Combination
Comb Filter
COMP : Comparator
Composite
Compensation
CONN : Connector
CPC : Capstan Phase Control
CTC : Crosstalk Cancel
CPU : Central Processing Unit
CTL : Control

D
D : Drum
DAC : Digital to Analog Converter
dB : Decibel
DC : Direct Current
DD : Direct Drive
DEC : Decoder
DEMOD : Demodulator
DEMUX : Demultiplexer
DET : Detector
DEV : Deviation
DFRS : Drum Free RUN STOP
DIF TRANS : Differential Transformer
DISCR : Discriminator
DL : Delay Line
DOC : Dropout Compensator
DOD : Drop Out Detector
DPC : Drum Phase Control
DYAC : Dynamic Aperture Control

E
E : Edit
EDP : Electronic Data Processing
E-E : Electric to Electric
EF : Emitter-Follower
EMP : Emphasis
ENC : Encoder
EN : Enable
ENV : Envelope
EOT : End of Tape
EP : Extended Play
EQ : Equalizer
ES : Electronic Switch
ESNS : End Sensor
EXP : Expander
EXT : External

F
F : Farad
F ADV : Frame Advance
FDP : Fluorescent Display Panel
FE : Full Erase
FET : Field Effect Transistor
FF : Fast Forward
Flipflop
FG : Frequency Generator
FM : Frequency Modulation
FMA : FM Audio
FR : Full Recording, Frame
FREQ : Frequency
F-V CONV : Frequency to Voltage Converter
FWD : Forward
FWD S : Forward Search

G
G : Green
GEN : Generator
GND : Ground
GRN : Green
GRY : Gray

H
H : High
HBF : Horizontal Burst Flag
HD : Horizontal Drive
HG : Hall Generator
HPF : Highpass Filter
Hz : Herz

I
IC : Integrated Circuit
ID : Identification (Pulse)
IF : Intermediate Frequency
IFR : Infrared
IFT : Intermediate Frequency Transfomer

IND : Indicator
INH : Inhibit
INS : Insert
INT : Internal, Interrupt
INV : Inverter
I/O : Input/Output
IR : Infrared

L
L : Low, Left
LED : Light Emitting Diode
LIN : Linearity
LIM : Limiter
LOAD : Loading (Cassette)
LP : Long Play
LPF : Lowpass Filter
LSB : Lower Sidedband

M
M : Motor
MAX : Maximum
MDA : Motor Drive Amplifier
MECHACON : Mechanism Control
MIC : Microphone
MIN : Minimum
MIX : Mixer
MMV : Monostable Multivibrator
MOD : Modulation
MODEM : Modulator-Demodulator
MON : Monitor
MOS : Metal Oxide Silicon
MPX : Multiplexer
MS : Mode Select
MUT : Muting

N
NAND : Not-And
NC : Not Connected
NFB : Negative Feedback
NLN : Non-Linear
NO : Normally Open
NOR : Normal

O
OPAMP : Operational Amplifier
OP : Operation
ORN : Orange
OSC : Oscillator

P
PB : Playback
PC : Photocoupler, Pulse Counter
PCM : Pulse Code Modulation
PGM : Program
PG : Pulse Generator
PI : Photo Interrupter
PIF : Picture Intermediate Frequency
PLL : Phase Locked Loop
p-p : Peak-to-Peak
POS : Position
PR : Pinch Roller
PREAMP : Preamplifier
PRL : Preroll
P/S : Pause/Still
PSC : Pulse Swallowing Control
PU : Pickup
PWB : Printed Wiring Board
PWM : Pulse Width Modulation
PWR : Power

Q
Q : Quality Factor

R
R : Red, Right
RA : Resistor Array
RAM : Random Access Memory
REC : Recording
REG : Regulated
REM : Remote
REMOCON : Remote Control (Unit)
REV : Reverse
REV S : Reverse Search
REW : Rewind
RF : Radio Frequency
RS FF : RS Flipflop
RST : Reset
R/P : Record/Playback
RPT : Repeat
RT : Rotary Transformer
RUN : Running
RY : Relay

S
SC : Subcarrier, Simulcast
SAW : Sawtooth
SCH : Search
SEL : Select
SENS : Sensor
SEP : Separator
SF : Source Follower
SFF : Short Fast Forward
SIF : Sound Intermediate Frequency
SN : Signal to Noise Ratio
SOL : Solenoid
SOS : Sound on Sound
SP : Standard Play
SR : Supply Reel
SREW : Short Rewind
S/S : Slow/Still
SSG : Sync Signal Generator
SSNS : Start Sensor
STD : Strobe Data
SUP : Supply
SW : Switch
SWD : Switched
SYNC : Synchronization
SYSCON : System Control

T
TBC : Time Base Corrector
TF : Temperature Fuse
TP : Test Point
TPZD : Trapezoid
TR : Transistor; Transformer
TU : Take-Up
TC : Tension Control, Time code
TAL : Tally
TEN : Tension
TK : Tracking
TIM : Timing
T/T : Tuner/Timer
TUN : Tuner

U
UL : Unloading
UNREG : Unregulated
UNSW : Unswitched

V
V : Volt
V : Volt
VACT : Video Action
VCO : Voltage Controlled Oscillator
VD : Vertical Drive
VIF : Video Intermediate Frequency
VR : Variable Resistor
VS : Video and Sync
VXO : Variable Crystal Oscillator
VLT : Violet
V/T : Video/Television
V/U : VHF/UHF
VSCH : Variable Search

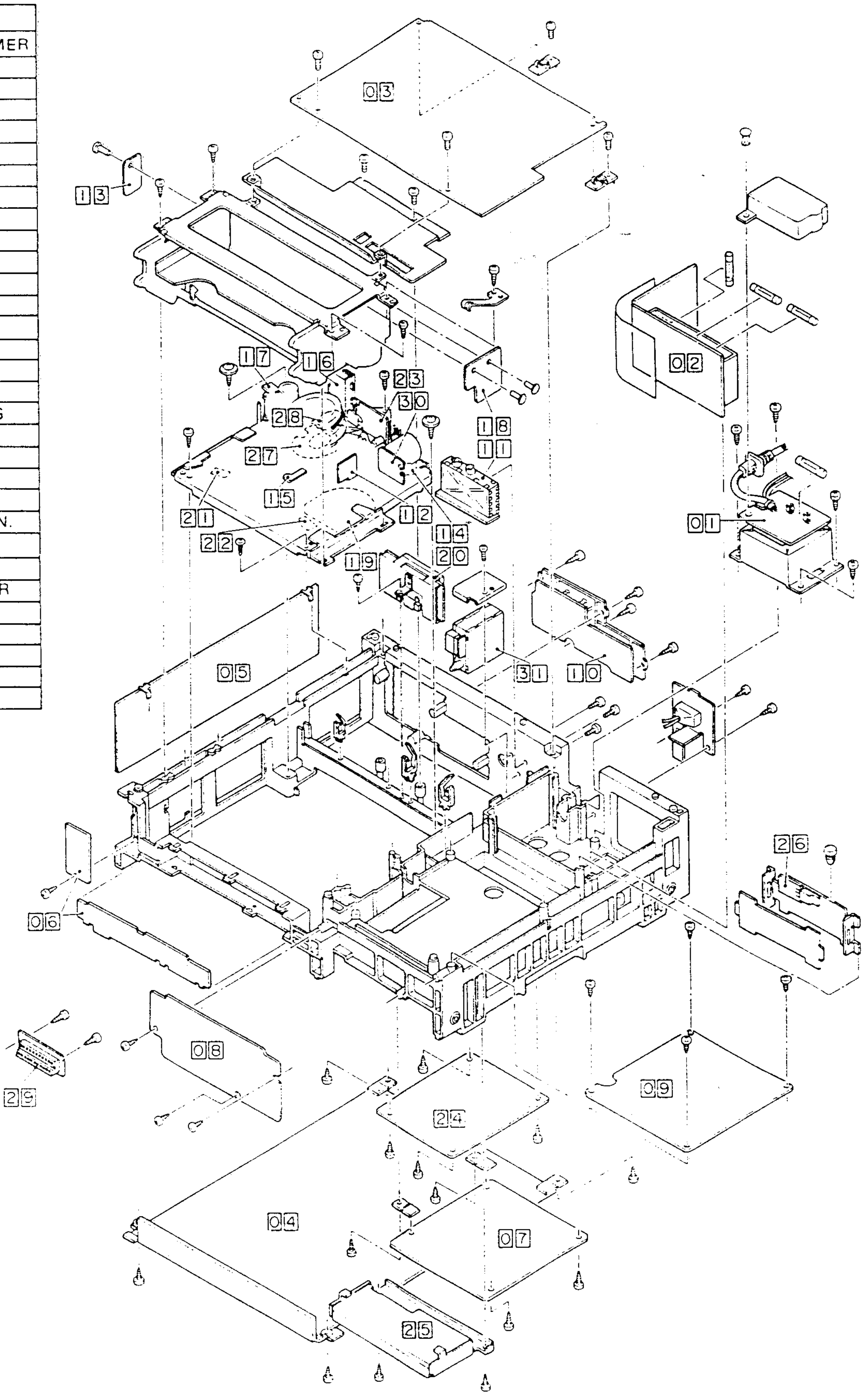
W
W : Watt
WHT : White
WV : Working Voltage
W & D : White and Dark
WARN : Warning

X
XTAL : Crystal

Y
Y : Luminance
YEL : Yellow

4.2 CIRCUIT BOARD LOCATIONS

No.	NAMES
01	POWER TRANSFORMER
02	REGULATOR
03	VIDEO
04	A/S/M
05	FM AUDIO
06	OPERATION
07	TUNER/IF
08	DISPLAY
09	TUNER/TIMER CTL
10	TERMINAL
11	RF SWITCH
12	A/CTL HEAD
13	END SENSOR
14	LOADING SENSOR
15	LED SENSOR
16	PREAMP
17	FULL ERASE HEAD
18	CASSETTE HOUSING
19	CAPSTAN MOTOR
20	DRUM MDA
21	SUPPLY SENSOR
22	TAKE UP SENSOR
23	DRUM MOTOR CONN.
24	DEMODULATOR
25	PROGRAM
26	POWER TRANSISTOR
27	DRUM FG
28	DRUM MOTOR
29	AUDIO LEVEL IND.
30	MODE CTL MOTOR
31	RF MODULATOR


03
13
02
17
16
23
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18
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15
21
12
22
14
20
19
01
05
31
10
26
06
08
29
24
09
04
07
25

4.2.1 Connections

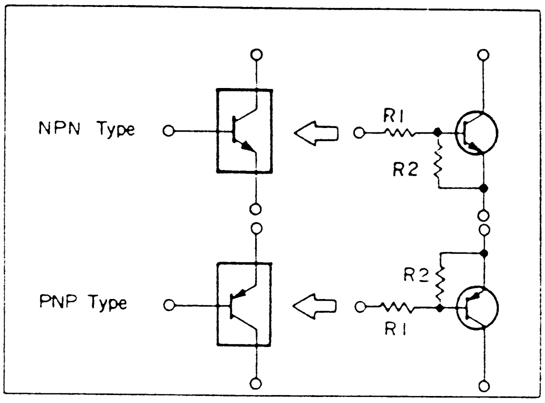
▣ : Connector
○ : Board
▢ : Board in connector
⬭ : Connected pattern in the board.

4.2.2 Indications

COUNT UP : Active only at high.
$\overline{\text{COUNT DOWN}}$: Active only at low.

4.2.3 Digital transistor

DIGITAL TRANSISTOR



RESISTOR VALUES

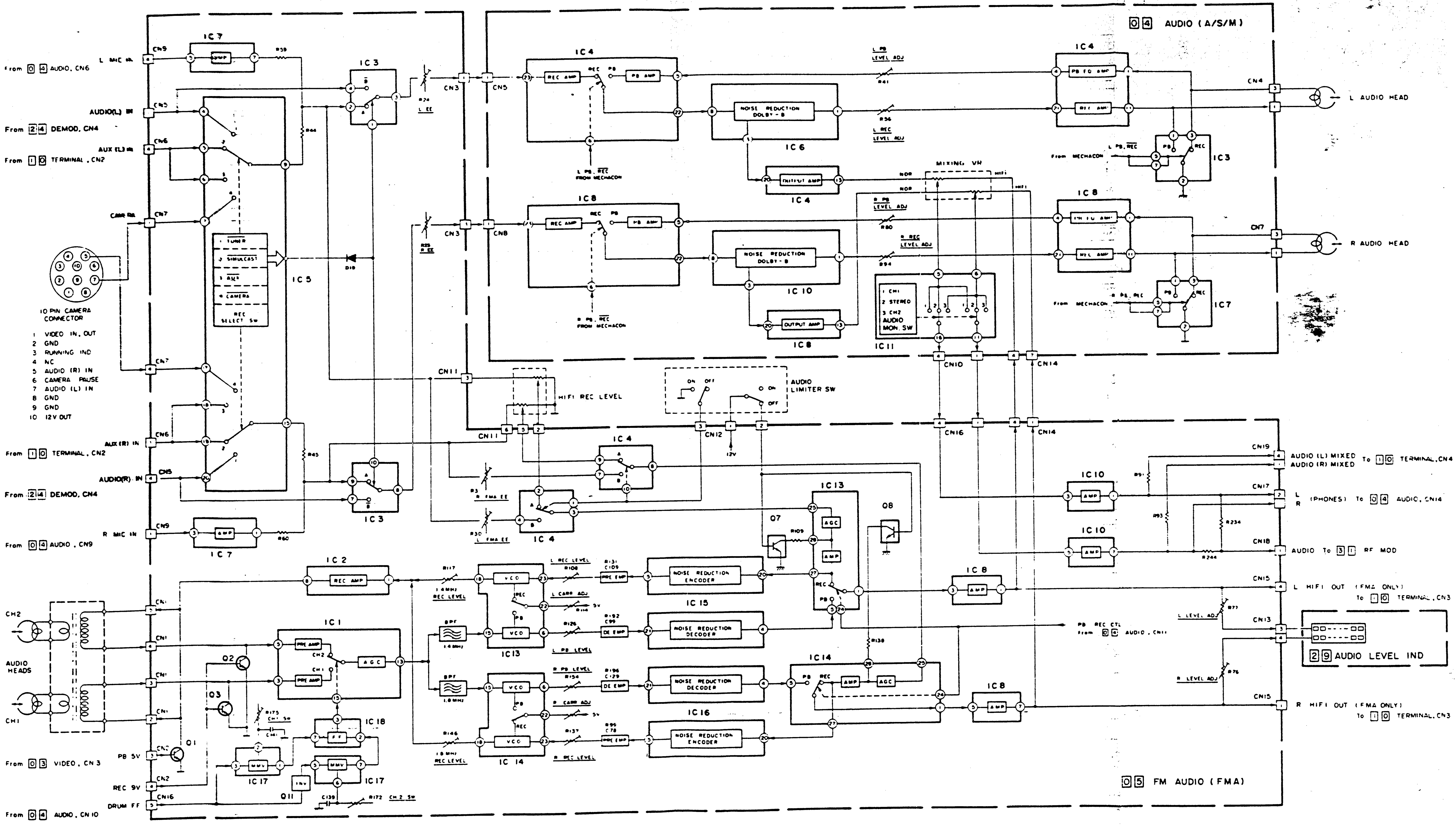
JUNCTION	Part NO.	R1 (KΩ)	R2 (KΩ)
PNP	DTA114	10	10
	DTA124	22	22
	DTA144	47	47
	DTA144WF	47	22
	DTA114Y	10	47
	DTA114T	10	OPEN
NPN	DTC114	10	10
	DTC124	22	22
	DTC144	47	47
	DTC144WT	47	22
	DTC114Y	10	47
	DTC143T	4.7	OPEN

Note: The digital transistor includes built in resistors.
It features small size and high rellability.
Both PNP and NPN types are available.
USES: INVERTER, INTERFACE, DRIVER CIRCUITS.

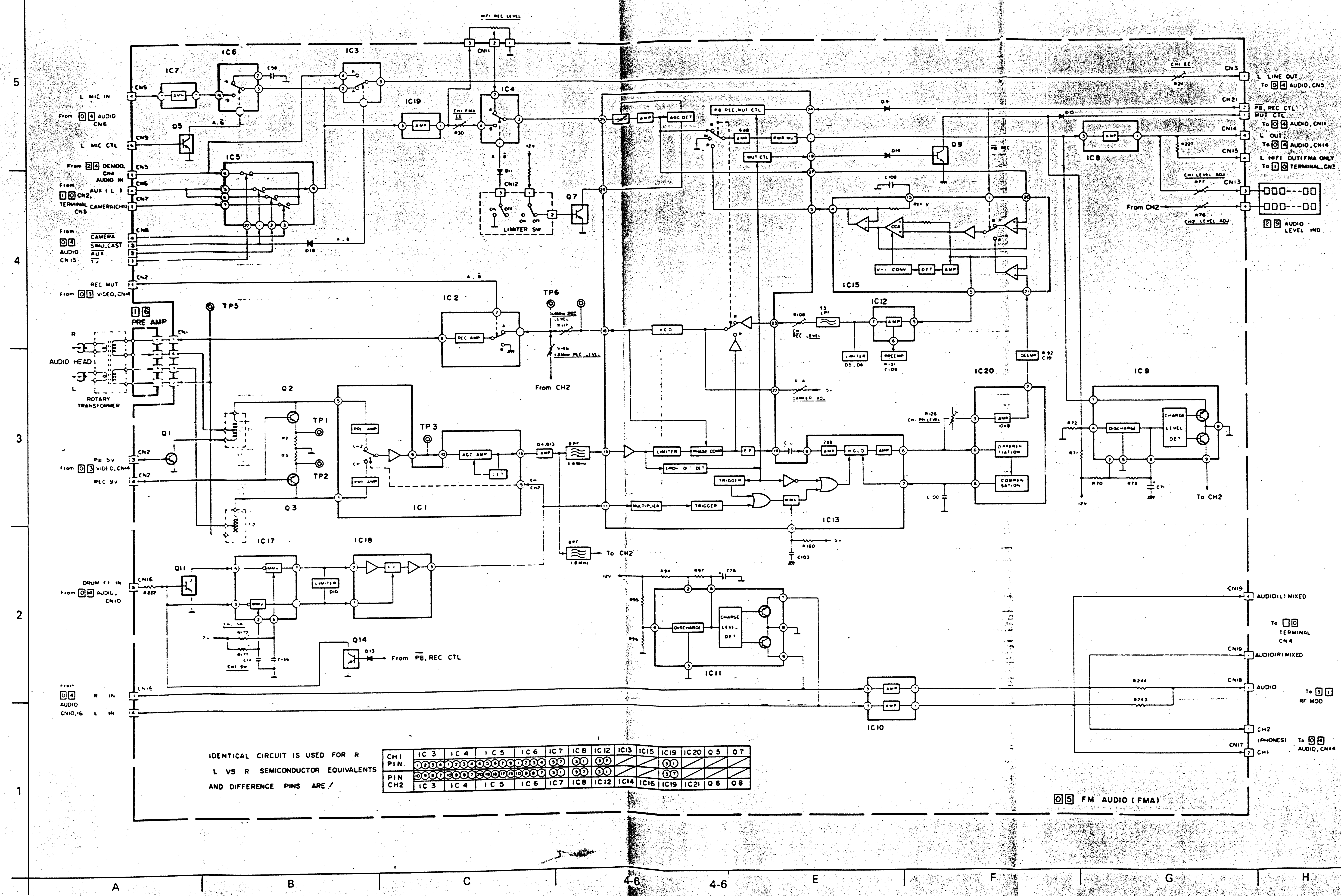
4.2.4 Signal flow in the schematic

——————→ Recording signal path
– – – – – –→ Playback signal path
—·—·—→ REC/PB signal path

4.3 OVERALL AUDIO BLOCK DIAGRAM


0 4 AUDIO (A/S/M)
0 5 FM AUDIO (FMA)
2 9 AUDIO LEVEL IND
From 0 4 AUDIO, CN6
L MIC IN
AUDIO(L) IN
From 2 4 DEMOD, CN4
AUX (L) IN
From 1 0 TERMINAL, CN2
CAM IN
10 PIN CAMERA CONNECTOR
1 VIDEO IN, OUT
2 GND
3 RUNNING IND
4 NC
5 AUDIO (R) IN
6 CAMERA PAUSE
7 AUDIO (L) IN
8 GND
9 GND
10 12V OUT
AUX (R) IN
From 1 0 TERMINAL, CN2
AUDIO(R) IN
From 2 4 DEMOD, CN4
R MIC IN
From 0 4 AUDIO, CN9
1 TUNER
2 SIMULCAST
3 AUX
4 CAMERA
REC SELECT SW
IC 5
IC 7
IC 3
IC 4
IC 6
IC 8
IC 10
IC 11
REC AMP
PB AMP
NOISE REDUCTION DOLBY-B
OUTPUT AMP
L PB, REC FROM MECHACON
R PB, REC FROM MECHACON
L PB LEVEL ADJ
L REC LEVEL ADJ
R PB LEVEL ADJ
R REC LEVEL ADJ
MIXING VR
NOR
HIFI
1 CH1
2 STEREO
3 CH2
AUDIO MON. SW
PB EQ AMP
REC AMP
From MECHACON
L AUDIO HEAD
R AUDIO HEAD
CN4
CN7
CN10
CN14
CN11
HIFI REC LEVEL
AUDIO LIMITER SW
ON
OFF
CN12
12V
CN16
CN19
AUDIO (L) MIXED
AUDIO (R) MIXED
To 1 0 TERMINAL, CN4
CN17
L
R
(PHONES) To 0 4 AUDIO, CN14
CN18
AUDIO To 3 1 RF MOD
CN15
L HIFI OUT (FMA ONLY) To 1 0 TERMINAL, CN3
CN13
R HIFI OUT (FMA ONLY) To 1 0 TERMINAL, CN3
L LEVEL ADJ
R LEVEL ADJ
PB REC CTL From 0 4 AUDIO, CN11
R3 R FMA EE
R30 L FMA EE
R74 L EE
R25 R EE
IC 2
IC 13
IC 14
IC 15
IC 16
IC 17
IC 18
VCO
BPF
1.4MHz
1.8MHz
1.4MHz REC LEVEL
1.8MHz REC LEVEL
L REC LEVEL
R REC LEVEL
L PB LEVEL
R PB LEVEL
L CARR ADJ
R CARR ADJ
PRE EMP
DE EMP
NOISE REDUCTION ENCODER
NOISE REDUCTION DECODER
AGC
AMP
Q1
Q2
Q3
Q7
Q8
Q11
PRE AMP
CH1
CH2
FF
MMV
INV
CH1 SW
CH2 SW
CH2
CH1
AUDIO HEADS
From 0 3 VIDEO, CN3
PB 5V
REC 9V
DRUM FF
From 0 4 AUDIO, CN10

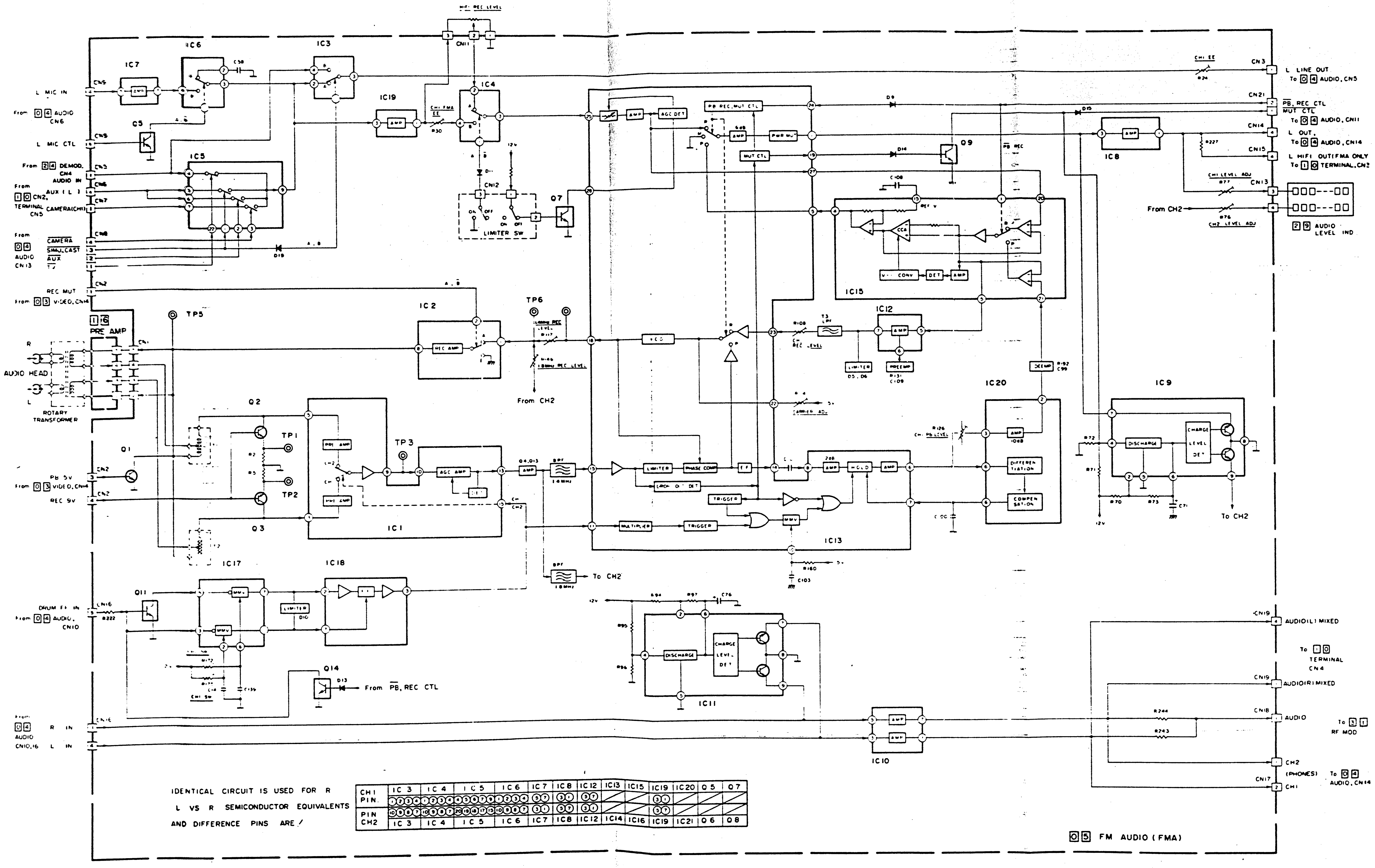
4.4 FM AUDIO BLOCK DIAGRAM


6
5
4
3
2
1
A
B
C
D
E
F
G
H
HIFI REC LEVEL
CN11
IC6
IC3
IC7
IC4
IC19
AMP
CH1 FMA EE
R30
L MIC IN
CN5
From 04 AUDIO CN6
Q5
L MIC CTL
CN9
IC5
From 24 DEMOD. CN4 AUDIO IN
From 10 CN2, TERMINAL CN5
AUX (L)
CN6
CN7
CAMERA(CH1)
From 04 AUDIO CN13
CN8
CAMERA
SIMU_CAST
AUX
TJ
D19
REC MUT
CN2
From 03 VIDEO, CN4
CN12
LIMITER SW
ON
OFF
Q7
12V
D11
16 PRE AMP
CN1
TP5
IC2
REC AMP
TP6
HIFI REC LEVEL
1.8MHz REC LEVEL
From CH2
R
L
AUDIO HEAD
ROTARY TRANSFORMER
Q1
Q2
Q3
TP1
TP2
TP3
PB1 AMP
PB2 AMP
AGC AMP
IC1
CN2
PB 5V
From 03 VIDEO, CN4
REC 9V
BPF
1.8MHz
To CH2
AMP
VCO
AGC DET
PB REC, MUT CTL
MUT CTL
PWR MUT
LIMITER
PHASE COMP
LOOP OUT DET
TRIGGER
MULTIPLIER
MMV
IC13
R160
C103
T3 LPF
CH1 REC LEVEL
R108
IC12
LIMITER
D5, D6
PREEMP
DEEMP
R131 C109
R92 C99
CARRIER ADJ
IC15
V-I CONV
DET
CCA
C108
REF V
IC20
AMP 10dB
DIFFEREN TIATION
COMPEN SATION
R126 CH1 PB LEVEL
IC9
DISCHARGE
CHARGE LEVEL DET
R72
R71
R70
R73
C71
12V
To CH2
Q9
D9
D14
D15
IC8
PB REC
CH1 EE
R24
CN3
L LINE OUT
To 04 AUDIO, CN5
CN21
PB, REC CTL
MUT CTL
To 04 AUDIO, CN11
CN14
L OUT
To 04 AUDIO, CN14
R227
CN15
L HIFI OUT(FMA ONLY
To 10 TERMINAL, CN2
CH1 LEVEL ADJ
R77
CN13
From CH2
R76
CH2 LEVEL ADJ
29 AUDIO LEVEL IND
IC17
IC18
MMV
LIMITER
D10
Q11
DRUM FF IN
CN16
From 04 AUDIO, CN10
R222
Q14
D13
From PB, REC CTL
CH1 SW
C135
R94
R97
C76
R95
R96
DISCHARGE
CHARGE LEVEL DET
IC11
From 04 AUDIO CN10, 16
R IN
L IN
CN16
IC10
AMP
R244
R243
CN18
AUDIO
To 31 RF MOD
CN19
AUDIO(L) MIXED
To 10 TERMINAL CN4
AUDIO(R) MIXED
CH2
(PHONES)
CN17
CH1
To 04 AUDIO, CN14
05 FM AUDIO (FMA)

IDENTICAL CIRCUIT IS USED FOR R
L VS R SEMICONDUCTOR EQUIVALENTS
AND DIFFERENCE PINS ARE!

CH1	IC 3	IC 4	IC 5	IC 6	IC 7	IC 8	IC 12	IC13	IC15	IC19	IC20	Q 5	Q 7
PIN.	①②③④	①②③④	④⑤⑥⑦⑨	①②③④	⑤⑦	③①	⑤⑦			③①			
PIN	⑩⑨⑧⑦	⑩⑨⑧⑦	⑳⑲⑱⑰⑬	⑩⑨⑧⑦	③①	⑤⑦	③①			⑤⑦			
CH2	IC 3	IC 4	IC 5	IC 6	IC7	IC8	IC 12	IC14	IC16	IC19	IC21	Q 6	Q 8

4.4 FM AUDIO BLOCK DIAGRAM



HIFI REC LEVEL
CN11
IC7
IC6
IC3
IC4
IC19
AMP
CH1 FMA EE
R30
L MIC IN
From 04 AUDIO CN6
C5
L MIC CTL
IC5
From 24 DEMOD. CN4 AUDIO IN
From 10 CN2, TERMINAL CN5
AUX (L)
CAMERA(CH1)
From 04 AUDIO CN13
CAMERA
SIMU_CAST
AUX
TJ
D19
CN12
ON OFF
LIMITER SW
Q7
REC MUT
From 03 VIDEO, CN14
IC2
REC AMP
TP5
TP6
116 PRE AMP
AUDIO HEAD
R
L
ROTARY TRANSFORMER
Q2
Q1
Q3
TP1
TP2
TP3
PB 5V
From 03 VIDEO, CN14
REC 9V
PB1 AMP
PB2 AMP
AGC AMP
IC1
Q4,Q13
AMP
BPF 1.4MHz
BPF 1.8MHz
To CH2
From CH2
IC17
IC18
MMV
LIMITER D10
Q11
DRUM FF IN
From 04 AUDIO, CN10
R222
Q14
D13
From PB, REC CTL
CH1 SW
From 04 AUDIO CN10,16
R IN
L IN
AGC DET
PB REC,MUT CTL
PWR MUT
MUT CTL
D9
D14
Q9
D15
IC8
IC15
CCA
V-I CONV
DET
AMP
IC12
T3 LPF
R108
CH1 REC LEVEL
LIMITER D5, D6
PREEMP R131 C109
DEEMP R192 C99
VCO
CARRIER ADJ
IC20
AMP 10dB
DIFFERENTIATION
COMPENSATION
R126 CH1 PB LEVEL
LIMITER
PHASE COMP
LPF
HOLD
AMP
TRIGGER
MULTIPLIER
MMV
IC13
IC9
DISCHARGE
CHARGE LEVEL DET
R72
R71
R70
R73
C71
To CH2
IC11
R94
R97
C76
R95
R96
R160
C103
IC10
R244
R243
CN3
L LINE OUT To 04 AUDIO, CN5
CH1 EE
CN21
PB, REC CTL
MUT CTL
To 04 AUDIO, CN11
CN14
L OUT, To 04 AUDIO, CN14
CN15
L HIFI OUT(FMA ONLY To 10 TERMINAL, CN2
R227
CH1 LEVEL ADJ R77
CN13
From CH2
R76 CH2 LEVEL ADJ
29 AUDIO LEVEL IND
CN19
AUDIO(L) MIXED
To 10 TERMINAL CN4
AUDIO(R) MIXED
CN18
AUDIO
To 31 RF MOD
CH2
(PHONES)
CN17
CH1
To 04 AUDIO, CN14
12V
05 FM AUDIO (FMA)

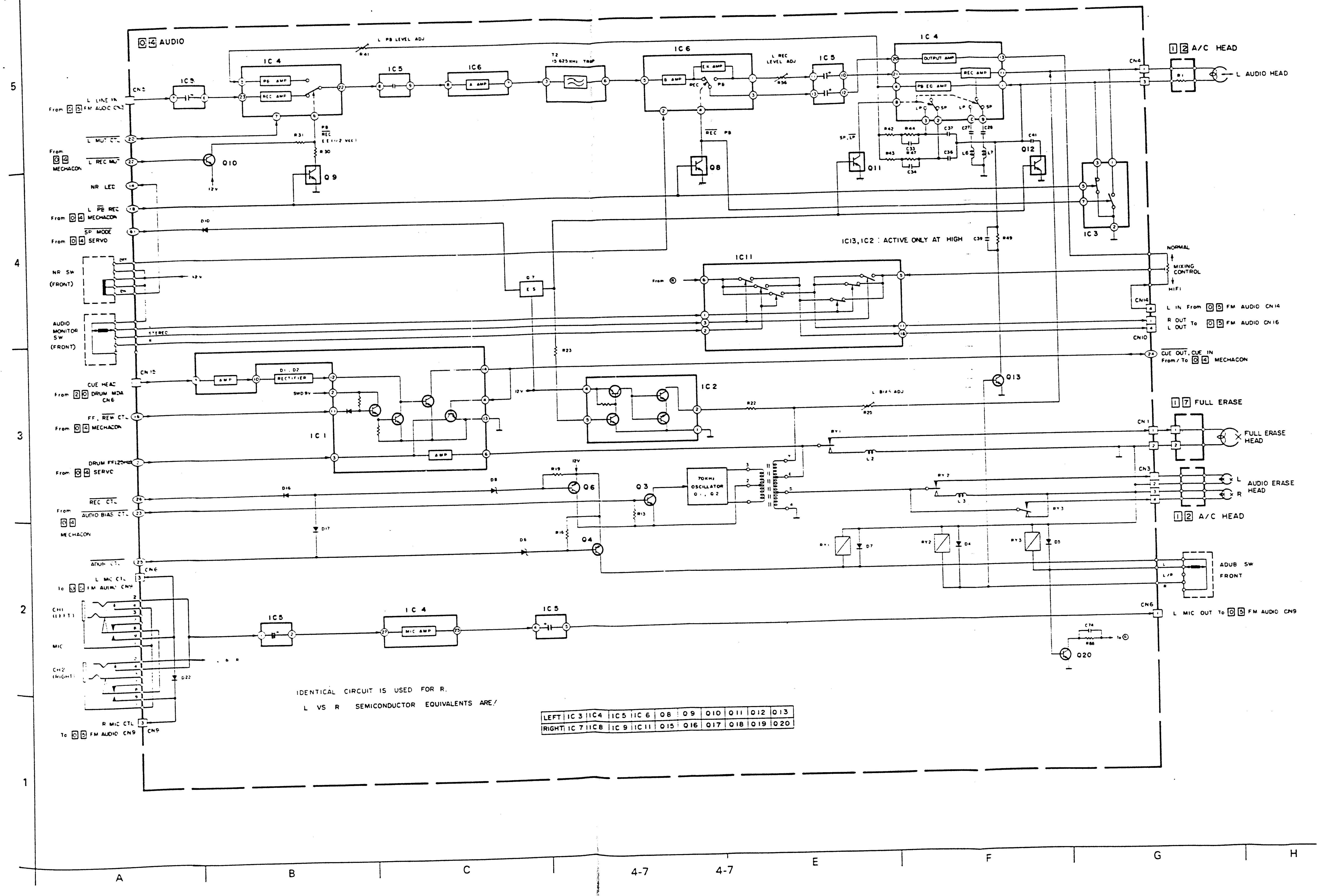
IDENTICAL CIRCUIT IS USED FOR R

L VS R SEMICONDUCTOR EQUIVALENTS

AND DIFFERENCE PINS ARE /

CH1	IC 3	IC 4	IC 5	IC 6	IC 7	IC 8	IC 12	IC13	IC15	IC19	IC20	Q 5	Q 7
PIN.	①②③④	①②③④	④⑤⑥⑦⑨	①②③④	⑤⑦	③①	⑤⑦			③①			
PIN	⑩⑨⑧⑦	⑩⑨⑧⑦	⑳⑲⑱⑰⑮	⑩⑨⑧⑦	③①	⑤⑦	③①			⑤⑦			
CH2	IC 3	IC 4	IC 5	IC 6	IC 7	IC 8	IC 12	IC14	IC16	IC19	IC21	Q 6	Q 8

4.5 AUDIO BLOCK DIAGRAM



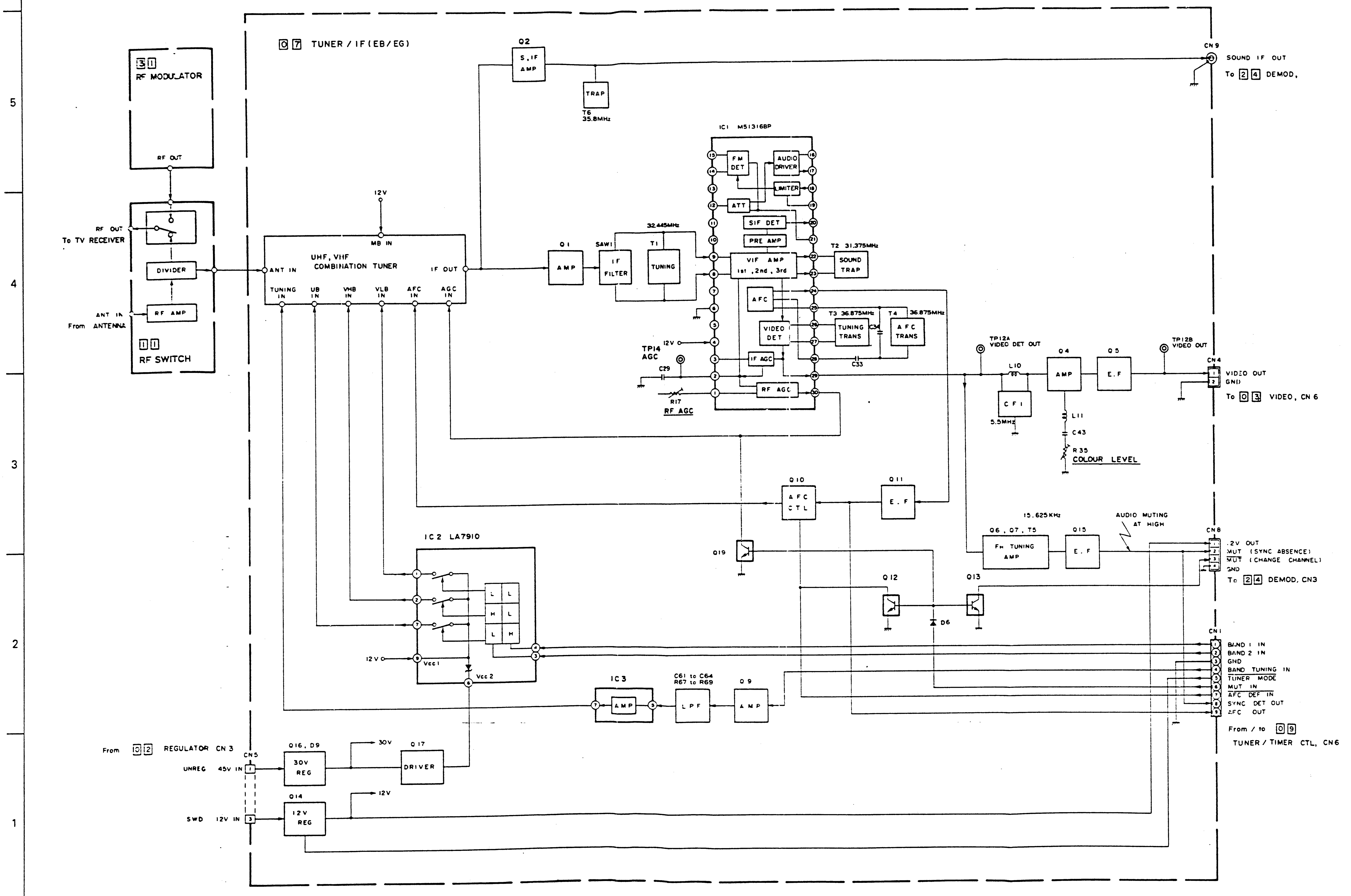
0 4 AUDIO
L PB LEVEL ADJ
R41
IC 4
PB AMP
REC AMP
IC5
IC5
IC6
A AMP
T2
15 625 KHz TRAP
IC6
B AMP
EK AMP
REC
PB
L REC
LEVEL ADJ
R36
IC5
IC 4
OUTPUT AMP
REC AMP
PB EQ AMP
LP
SP
LP
SP
R42
R44
C33
R47
C37
C27
C28
R43
C34
C36
L6
L7
C41
Q12
SP, LP
Q11
REC PB
Q8
PB
REC
EE (1/2 VCC)
R31
R30
Q9
Q10
12V
CN5
L LINE IN
From 0 5 FM AUDIO CN3
L MUT CTL
From
0 4
MECHACON
L REC MUT
NR LED
L PB REC
From 0 4 MECHACON
SP MODE
From 0 4 SERVO
D10
NR SW
(FRONT)
12V
AUDIO
MONITOR
SW
(FRONT)
STEREO
R
Q7
ES
R23
1 2 A/C HEAD
CN4
R1
L AUDIO HEAD
IC 3
IC13, IC2 : ACTIVE ONLY AT HIGH
C39
R49
IC11
From R
NORMAL
MIXING
CONTROL
HIFI
CN14
L IN From 0 5 FM AUDIO CN14
R OUT
L OUT
To 0 5 FM AUDIO CN16
CN10
CUE OUT, CUE IN
From / To 0 4 MECHACON
CN15
CUE HEAD
From 2 0 DRUM MDA
CN6
AMP
D1, D2
RECTIFIER
SWD 9V
FF, REW CTL
From 0 4 MECHACON
IC 1
AMP
12V
IC2
R22
L BIAS ADJ
R25
Q13
1 7 FULL ERASE
CN1
FULL ERASE
HEAD
RY1
L2
DRUM FF(25Hz)
From 0 4 SERVO
12V
R19
D8
Q6
Q3
70KHz
OSCILLATOR
Q1, Q2
D16
REC CTL
From
AUDIO BIAS CTL
0 4
MECHACON
D17
R13
R16
D6
Q4
ADUB CTL
RY2
L3
RY3
CN3
L
R
AUDIO ERASE
HEAD
1 2 A/C HEAD
RY1
D7
RY2
D4
RY3
D5
ADUB SW
FRONT
L
L/R
R
CN6
L MIC CTL
To 0 5 FM AUDIO CN9
CH1
(LEFT)
MIC
CH2
(RIGHT)
D22
to R
IC5
IC 4
MIC AMP
IC 5
CN6
L MIC OUT To 0 5 FM AUDIO CN9
C74
R88
to E
Q20
R MIC CTL
To 0 5 FM AUDIO CN9
CN9
6
5
4
3
2
1
A
B
C
E
F
G
H

IDENTICAL CIRCUIT IS USED FOR R.

L VS R SEMICONDUCTOR EQUIVALENTS ARE:

LEFT	IC 3	IC4	IC5	IC 6	Q8	Q9	Q10	Q11	Q12	Q13
RIGHT	IC 7	IC8	IC 9	IC 11	Q15	Q16	Q17	Q18	Q19	Q20

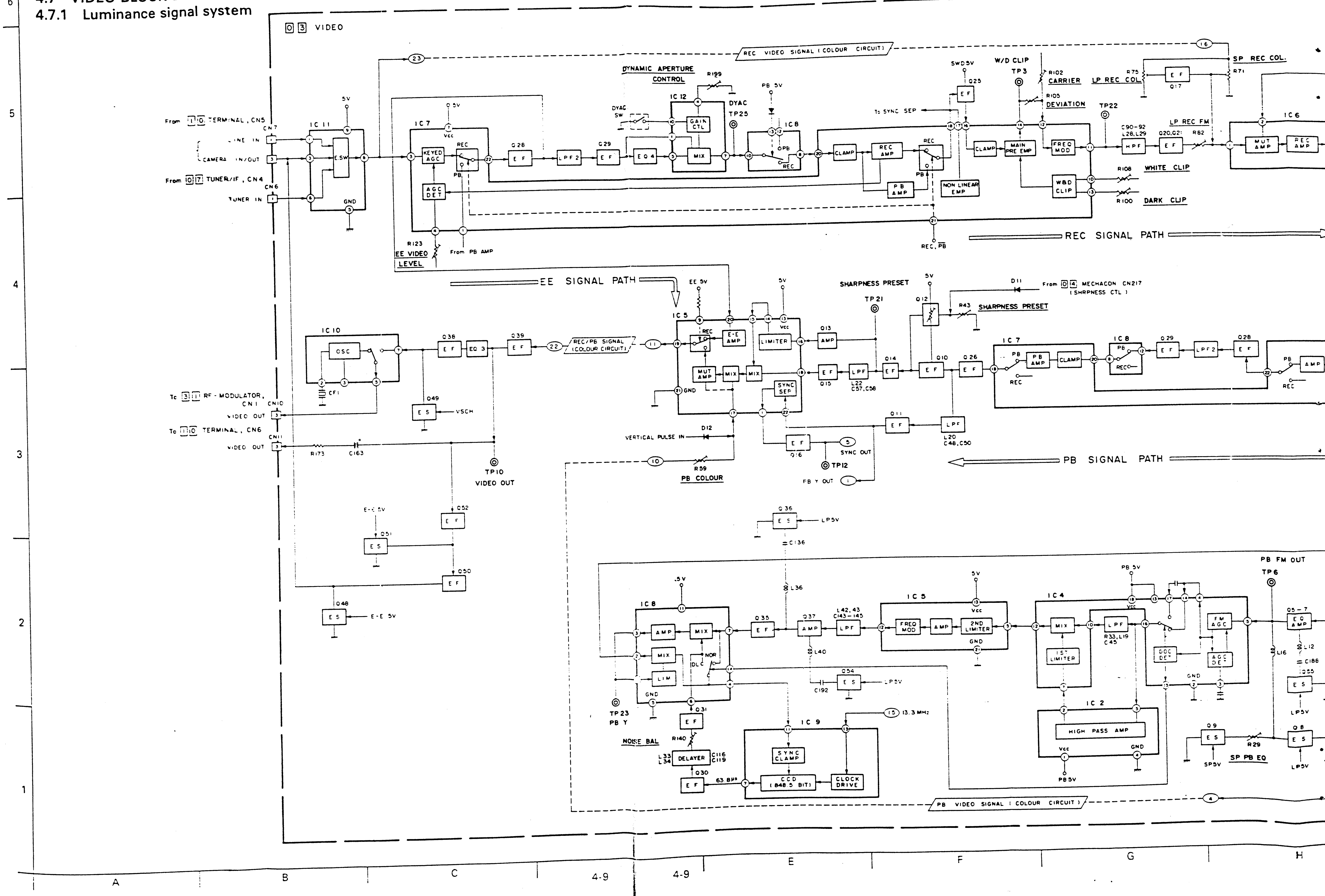
4.6 TUNER/IF BLOCK DIAGRAM



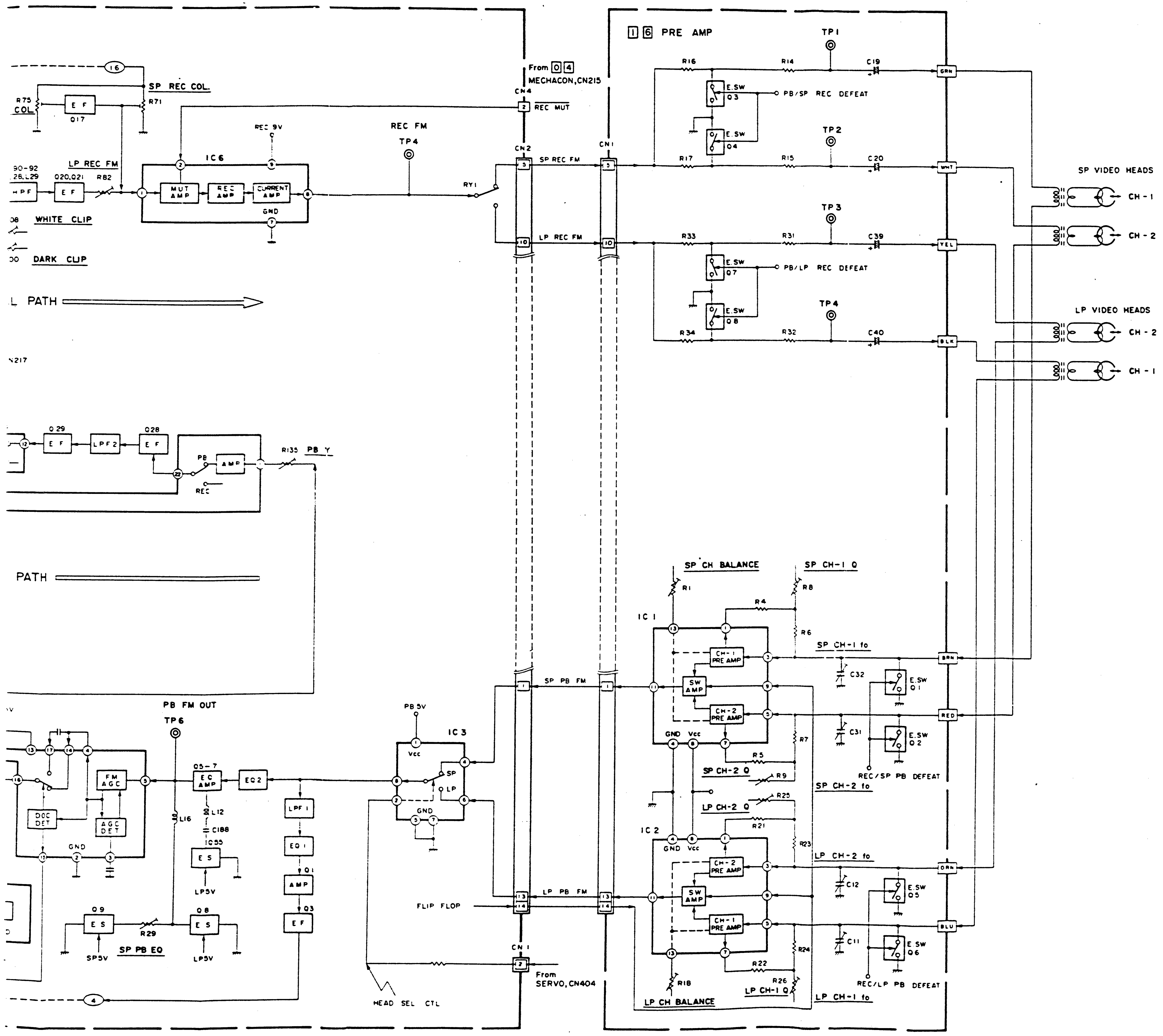
6
5
4
3
2
1
07 TUNER / IF (EB/EG)
31 RF MODULATOR
RF OUT
RF OUT
To TV RECEIVER
DIVIDER
ANT IN
From ANTENNA
RF AMP
01 RF SWITCH
12V
MB IN
UHF, VHF COMBINATION TUNER
ANT IN
IF OUT
TUNING IN
UB IN
VHB IN
VLB IN
AFC IN
AGC IN
Q2
S. IF AMP
TRAP
T6 35.8MHz
CN 9
SOUND IF OUT
To 24 DEMOD,
Q1
AMP
SAW1
IF FILTER
32.445MHz
T1
TUNING
IC1 M51316BP
FM DET
AUDIO DRIVER
LIMITER
ATT
SIF DET
PRE AMP
VIF AMP 1st, 2nd, 3rd
AFC
VIDEO DET
IF AGC
RF AGC
T2 31.375MHz
SOUND TRAP
T3 36.875MHz
TUNING TRANS
C34
T4 36.875MHz
AFC TRANS
C33
TP14 AGC
12V
C29
R17
RF AGC
TP12A VIDEO DET OUT
L10
CFI
5.5MHz
Q4
AMP
L11
C43
R35
COLOUR LEVEL
Q5
E.F
TP12B VIDEO OUT
CN4
VIDEO OUT
GND
To 03 VIDEO, CN 6
Q10
AFC CTL
Q11
E.F
15.625KHz
Q6, Q7, T5
FH TUNING AMP
Q15
E.F
AUDIO MUTING AT HIGH
CN8
12V OUT
MUT (SYNC ABSENCE)
MUT (CHANGE CHANNEL)
GND
To 24 DEMOD, CN3
Q19
Q12
Q13
D6
IC2 LA7910
Vcc1
Vcc2
12V
L L
H L
L H
IC3
AMP
C61 to C64
R67 to R69
LPF
Q9
AMP
CN1
BAND 1 IN
BAND 2 IN
GND
BAND TUNING IN
TUNER MODE
MUT IN
AFC DEF IN
SYNC DET OUT
AFC OUT
From / to 09 TUNER / TIMER CTL, CN6
From 02 REGULATOR CN 3
CN5
UNREG 45V IN
SWD 12V IN
Q16, D9
30V REG
30V
Q17
DRIVER
Q14
12V REG
12V
A
B
C
E
F
G
H

4.7 VIDEO BLOCK DIAGRAM

4.7.1 Luminance signal system

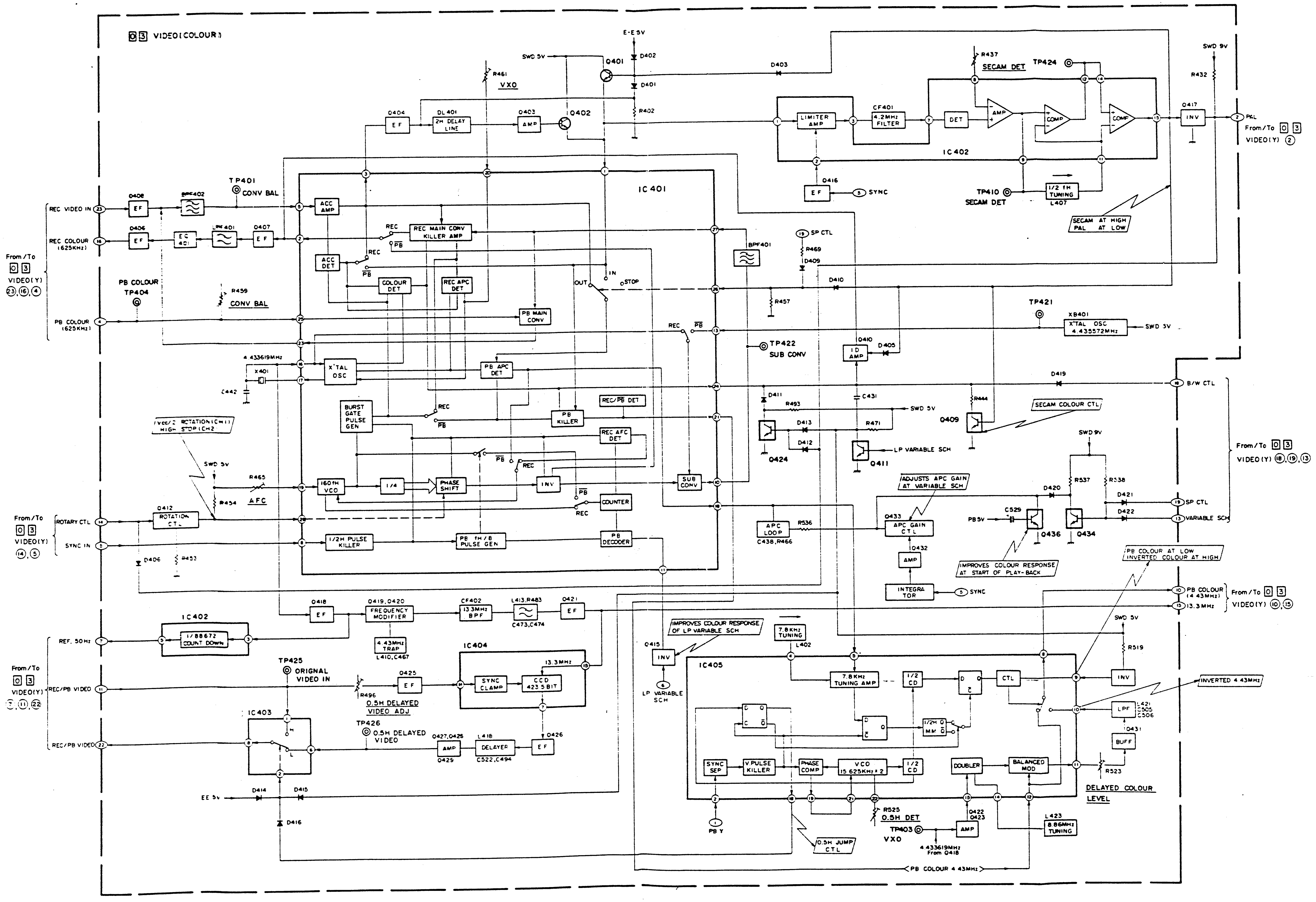


03 VIDEO
REC VIDEO SIGNAL (COLOUR CIRCUIT)
SP REC COL.
From 10 TERMINAL, CN5
CN7
LINE IN
CAMERA IN/OUT
From 07 TUNER/IF, CN4
CN6
TUNER IN
IC 11
E.SW
5V
GND
IC 7
KEYED AGC
AGC DET
REC
PB
Q 26
E F
LPF 2
Q29
EQ 4
DYNAMIC APERTURE CONTROL
R199
IC 12
DYAC SW
GAIN CTL
MIX
DYAC
TP25
PB 5V
IC 8
OPB
CLAMP
REC AMP
PB AMP
SWD5V
Q25
To SYNC SEP
NON LINEAR EMP
W/D CLIP
TP3
R102
CARRIER
R105
DEVIATION
MAIN PRE EMP
FREQ MOD
W&D CLIP
TP22
R75
LP REC COL
Q17
R71
C90-92
L28,L29
HPF
LP REC FM
Q20,Q21
R82
IC 6
MUT AMP
R108
WHITE CLIP
R100
DARK CLIP
REC, PB
R123
EE VIDEO LEVEL
From PB AMP
REC SIGNAL PATH
EE SIGNAL PATH
EE 5V
IC 5
E-E AMP
LIMITER
Vcc
MUT AMP
MIX
SYNC SEP
GND
Q13
AMP
SHARPNESS PRESET
TP21
Q12
R43
D11
From 04 MECHACON CN217 (SHRPNESS CTL)
IC 10
OSC
CF1
Q38
EQ 3
Q39
REC/PB SIGNAL (COLOUR CIRCUIT)
Q49
E S
VSCH
Q15
LPF
L22
C57,C58
Q14
Q10
Q26
Q29
LPF2
Q28
AMP
Q11
L20
C48,C50
To 31 RF-MODULATOR, CN1 CN10
VIDEO OUT
To 10 TERMINAL, CN6
CN11
R173
C163
TP10
VIDEO OUT
VERTICAL PULSE IN
D12
R59
PB COLOUR
Q16
SYNC OUT
TP12
PB Y OUT
PB SIGNAL PATH
E-E 5V
Q52
Q51
Q50
Q48
E-E 5V
Q36
LP5V
C136
L36
IC 8
AMP
MIX
LIM
NOR
IDLC
TP23
PB Y
Q31
NOISE BAL
R140
L33
L34
DELAYER
C116
C119
Q30
63.8µs
IC 9
SYNC CLAMP
CCD (848.5 BIT)
CLOCK DRIVE
13.3 MHz
Q35
Q37
L40
L42,43
C143-145
Q34
C192
IC 5
FREQ MOD
2ND LIMITER
IC 4
1ST LIMITER
R33,L19
C45
PB 5V
DOC DET
FM AGC
AGC DET
IC 2
HIGH PASS AMP
PB 5V
PB FM OUT
TP6
Q5-7
EQ AMP
L16
L12
C188
Q55
Q9
SP5V
R29
SP PB EQ
Q8
LP5V
PB VIDEO SIGNAL (COLOUR CIRCUIT)
6
5
4
3
2
1
A
B
C
E
F
G
H

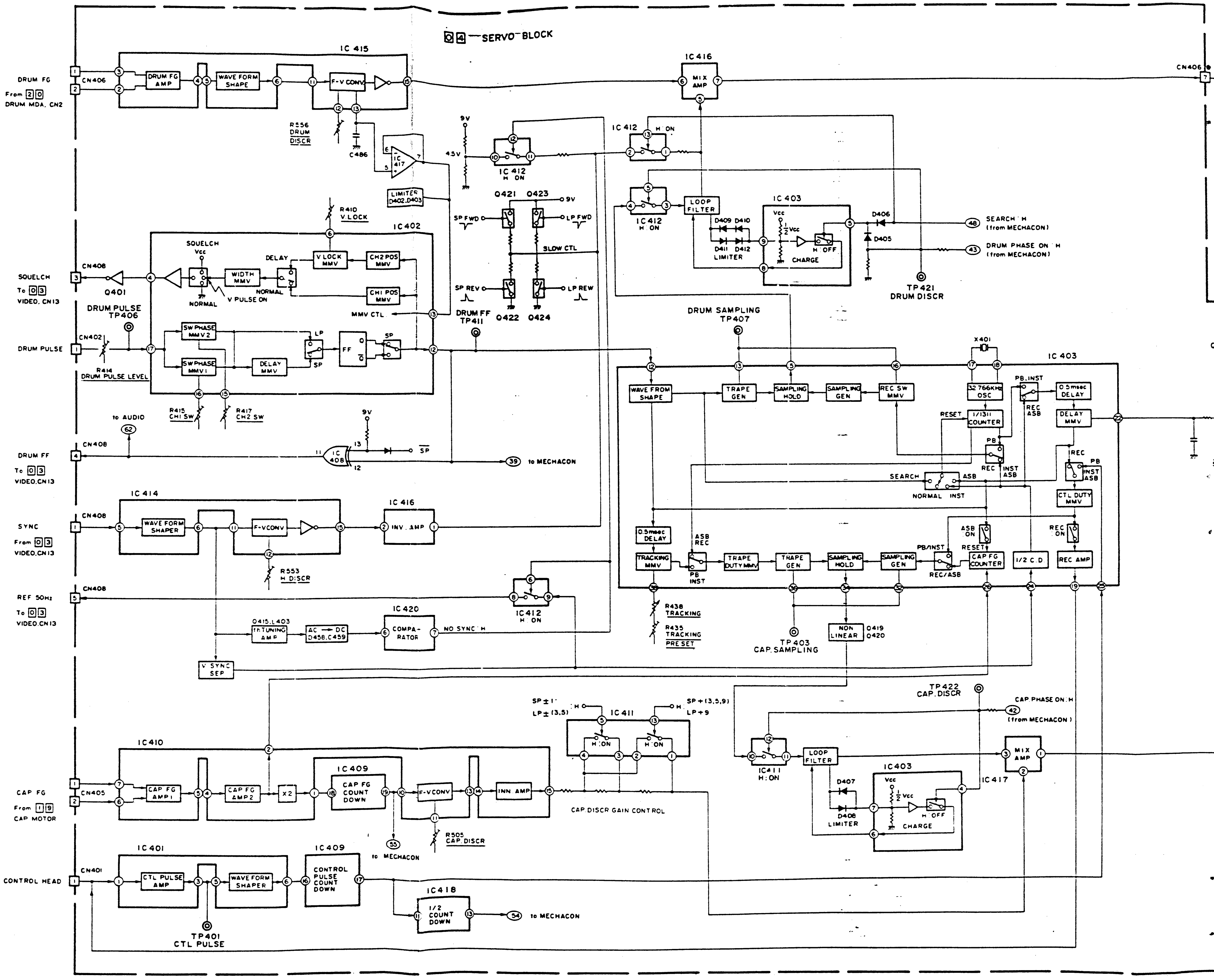


16 PRE AMP
From 04 MECHACON,CN215
CN4
REC MUT
SP REC COL.
R75 COL.
E F
Q17
R71
LP REC FM
90-92
L28,L29
Q20,Q21
R82
HPF
IC6
MUT AMP
REC AMP
CURRENT AMP
REC 9V
GND
REC FM
TP4
RY1
Q8 WHITE CLIP
DARK CLIP
L PATH
CN2
SP REC FM
LP REC FM
CN1
TP1
TP2
TP3
TP4
R16
R14
C19
E.SW Q3
PB/SP REC DEFEAT
E.SW Q4
R17
R15
C20
R33
R31
C39
E.SW Q7
PB/LP REC DEFEAT
E.SW Q8
R34
R32
C40
GRN
WHT
YEL
BLK
SP VIDEO HEADS
CH-1
CH-2
LP VIDEO HEADS
CH-2
CH-1
N217
Q29
E F
LPF2
Q28
E F
PB
AMP
REC
R135 PB Y
PATH
SP CH BALANCE
SP CH-1 Q
R1
R8
R4
R6
IC1
CH-1 PRE AMP
SW AMP
CH-2 PRE AMP
SP CH-1 fo
C32
E.SW Q1
BRN
RED
C31
E.SW Q2
GND Vcc
R7
R5
SP CH-2 Q
R9
REC/SP PB DEFEAT
SP CH-2 fo
LP CH-2 Q
R25
R21
R23
IC2
GND Vcc
CH-2 PRE AMP
SW AMP
CH-1 PRE AMP
LP CH-2 fo
C12
E.SW Q5
ORN
BLU
C11
E.SW Q6
R24
R22
R26
R18
LP CH BALANCE
LP CH-1 Q
REC/LP PB DEFEAT
LP CH-1 fo
SP PB FM
LP PB FM
PB FM OUT
TP6
DOC DET
FM AGC
AGC DET
GND
Q5-7
EC AMP
EQ2
L12
C188
Q55
L16
E S
LP5V
LPF1
EQ1
Q1
AMP
Q3
E F
PB 5V
IC3
Vcc
SP
LP
GND
FLIP FLOP
CN1
From SERVO,CN404
HEAD SEL CTL
Q9
E S
R29
Q8
E S
SP5V
SP PB EQ
LP5V

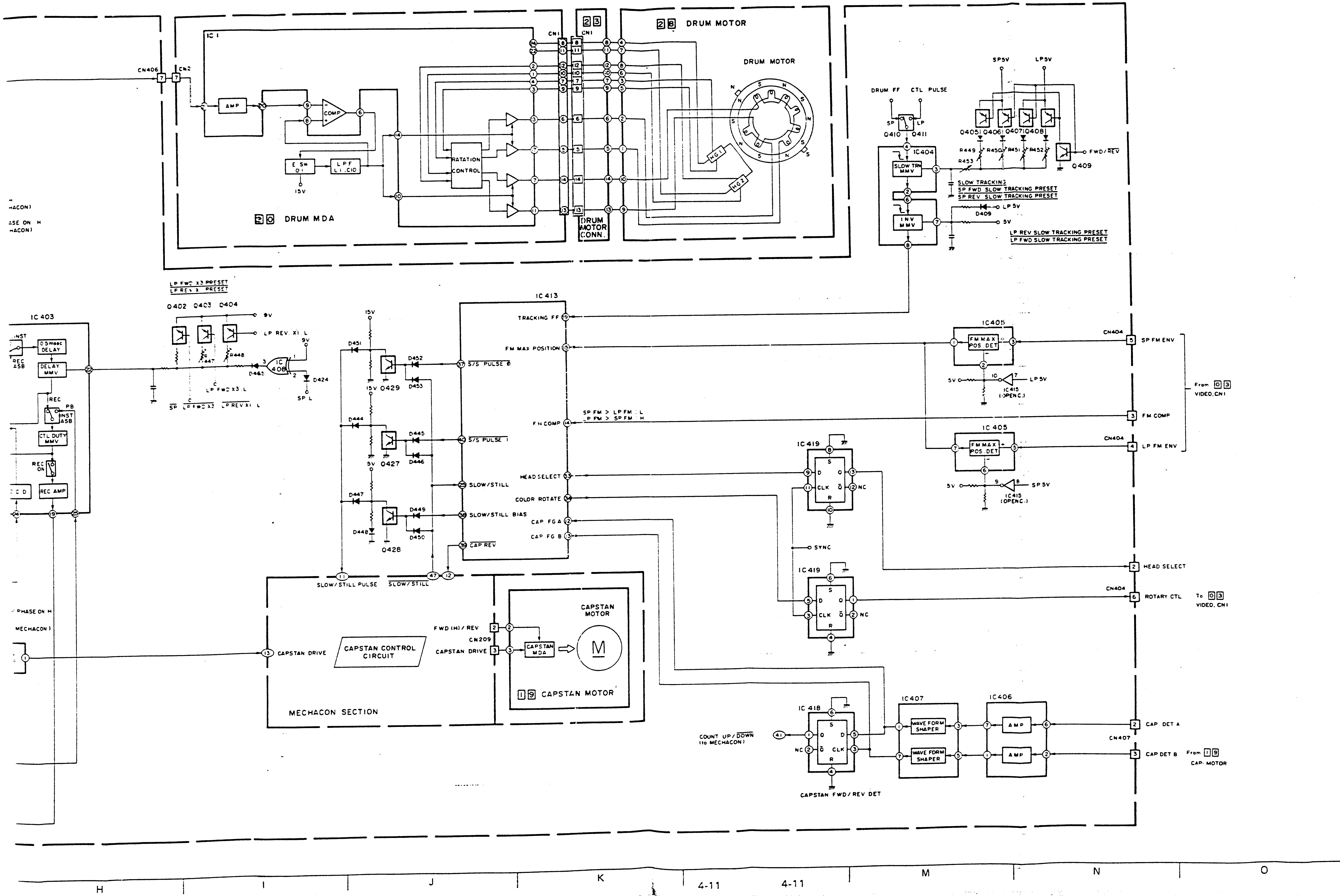
4.7.2 Colour signal system


03 VIDEO(COLOUR)
E-E 5V
SWD 5V
R461
VXO
Q401
D402
D401
R402
Q402
Q404
EF
DL401
2H DELAY LINE
Q403
AMP
D403
R437
SECAM DET
TP424
SWD 9V
R432
Q417
INV
PAL
From/To 03 VIDEO(Y) ②
LIMITER AMP
CF401
4.2MHz FILTER
DET
AMP
COMP
COMP
IC402
Q416
EF
SYNC
TP410
SECAM DET
1/2 fH TUNING
L407
SECAM AT HIGH
PAL AT LOW
TP401
CONV BAL
IC401
REC VIDEO IN
Q408
EF
BPF402
REC COLOUR (625KHz)
Q406
EF
EC 401
LPF401
Q407
EF
ACC AMP
REC
REC MAIN CONV KILLER AMP
PB
ACC DET
REC
PB
COLOUR DET
REC APC DET
BPF401
SP CTL
R469
D409
D410
R457
IN
STOP
OUT
From/To 03 VIDEO(Y) ㉓,⑯,④
PB COLOUR TP404
R459
CONV BAL
PB COLOUR (625KHz)
PB MAIN CONV
REC
PB
TP421
XB401
X'TAL OSC 4.435572MHz
SWD 5V
TP422
SUB CONV
Q410
ID AMP
D405
4.433619MHz
X401
X'TAL OSC
C442
PB APC DET
D419
B/W CTL
BURST GATE PULSE GEN
REC
PB
REC/PB DET
PB KILLER
D411
R493
C431
SWD 5V
R444
SECAM COLOUR CTL
Q409
Vcc/2 ROTATION(CH1) HIGH STOP(CH2)
REC AFC DET
D413
R471
D412
LP VARIABLE SCH
Q424
Q411
SWD 9V
From/To 03 VIDEO(Y) ⑱,⑲,⑬
SWD 5V
R465
R454
AFC
160fH VCO
1/4
PHASE SHIFT
PB
REC
INV
SUB CONV
PB
COUNTER
REC
ADJUSTS APC GAIN AT VARIABLE SCH
D420
R537
R538
D421
SP CTL
D422
VARIABLE SCH
From/To 03 VIDEO(Y) ⑭,⑤
ROTARY CTL
Q412
ROTATION CTL
SYNC IN
1/2H PULSE KILLER
PB fH/8 PULSE GEN
PB DECODER
APC LOOP
C438,R466
R536
Q433
APC GAIN CTL
PB 5V
C529
Q436
Q434
D406
R453
IMPROVES COLOUR RESPONSE AT START OF PLAY-BACK
Q432
AMP
PB COLOUR AT LOW INVERTED COLOUR AT HIGH
INTEGRATOR
SYNC
PB COLOUR (4.43MHz)
13.3MHz
From/To 03 VIDEO(Y) ⑩,⑮
Q418
EF
Q419,Q420
FREQUENCY MODIFIER
CF402
13.3MHz BPF
L413,R483
C473,C474
Q421
EF
IC402
REF. 50Hz
1/88672 COUNT DOWN
4.43MHz TRAP
L410,C467
IMPROVES COLOUR RESPONSE OF LP VARIABLE SCH
7.8KHz TUNING
L402
SWD 5V
R519
From/To 03 VIDEO(Y) ⑦,⑪,㉒
TP425
ORIGNAL VIDEO IN
Q425
EF
IC404
SYNC CLAMP
CCD 423.5 BIT
13.3MHz
Q415
INV
LP VARIABLE SCH
IC405
7.8KHz TUNING AMP
1/2 CD
D Q
CTL
INV
INVERTED 4.43MHz
REC/PB VIDEO
R496
0.5H DELAYED VIDEO ADJ
IC403
TP426
0.5H DELAYED VIDEO
Q427,Q428
Q429
AMP
L418
DELAYER
C522,C494
Q426
EF
1/2H MM
LPF
L421 C505 C506
Q431
BUFF
REC/PB VIDEO
SYNC SEP
V.PULSE KILLER
PHASE COMP
VCO 15.625KHz×2
1/2 CD
DOUBLER
BALANCED MOD
R523
DELAYED COLOUR LEVEL
EE 5V
D414
D415
D416
PB Y
R525
0.5H DET
TP403
VXO
Q422
Q423
AMP
4.433619MHz From Q418
L423
8.86MHz TUNING
0.5H JUMP CTL
PB COLOUR 4.43MHz

4.8 SERVO BLOCK DIAGRAM

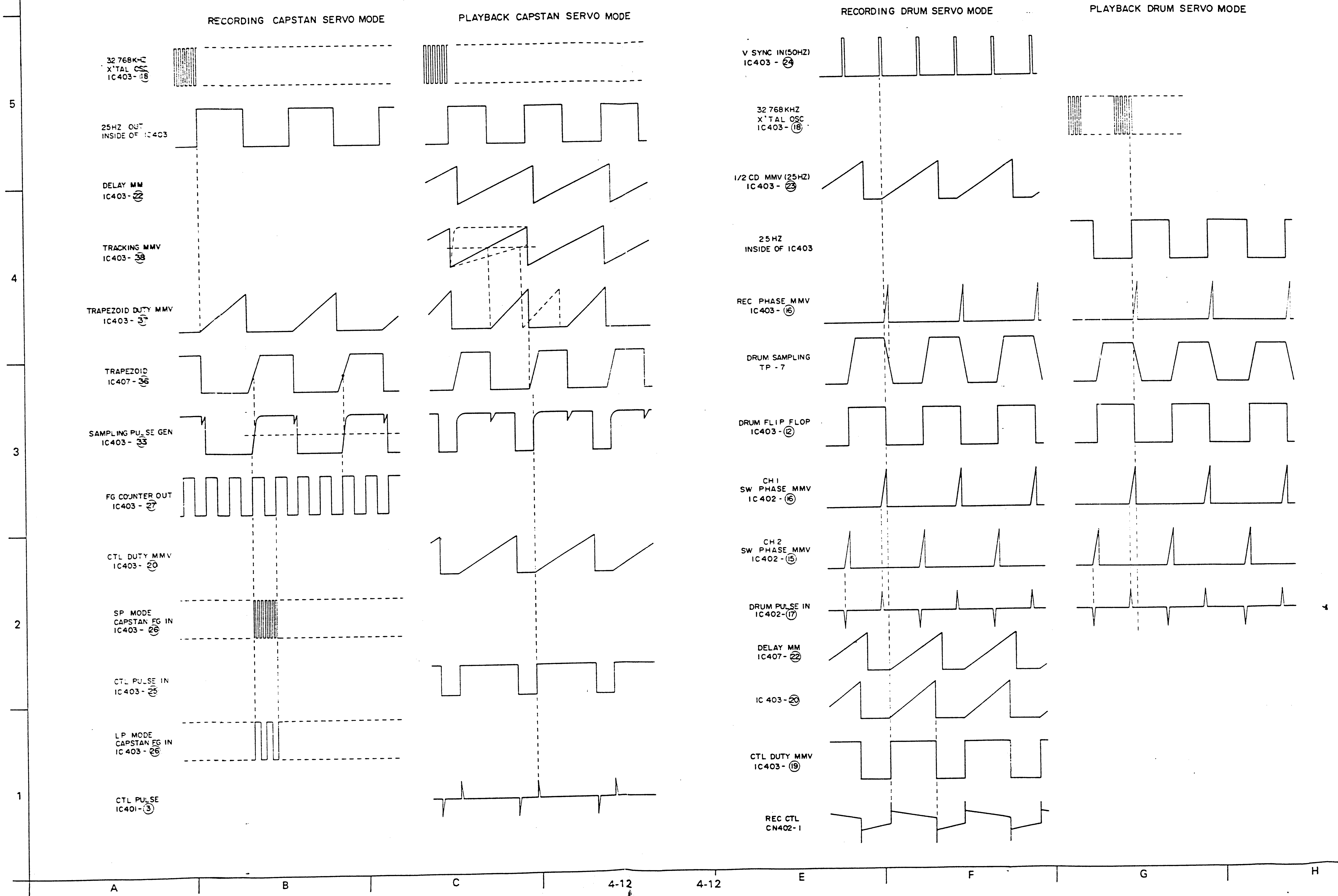


04 SERVO BLOCK
DRUM FG
From 20 DRUM MDA. CN2
CN406
IC415
DRUM FG AMP
WAVE FORM SHAPE
F-V CONV
R556 DRUM DISCR
C486
IC417
LIMITER D402,D403
IC416
MIX AMP
IC412 H: ON
9V
4.5V
Q421
Q423
Q422
Q424
SP FWD
LP FWD
SP REV
LP REW
SLOW CTL
LOOP FILTER
IC403
D409 D410
D411 D412
LIMITER
Vcc
1/2 Vcc
H: OFF
CHARGE
D406
D405
SEARCH: H (from MECHACON)
DRUM PHASE ON: H (from MECHACON)
TP421 DRUM DISCR
R410 V.LOCK
IC402
SQUELCH
To 03 VIDEO, CN13
Q401
DELAY
V LOCK MMV
CH2 POS MMV
WIDTH MMV
CH1 POS MMV
NORMAL
V PULSE ON
MMV CTL
DRUM PULSE TP406
DRUM PULSE
CN402
R414 DRUM PULSE LEVEL
SW PHASE MMV2
SW PHASE MMV1
DELAY MMV
LP
SP
FF
R415 CH1 SW
R417 CH2 SW
to AUDIO
DRUM FF TP411
DRUM FF
CN408
IC408
to MECHACON
DRUM SAMPLING TP407
X401
WAVE FROM SHAPE
TRAPE GEN
SAMPLING HOLD
SAMPLING GEN
REC SW MMV
32.766KHz OSC
1/1311 COUNTER
RESET
PB.INST
REC ASB
0.5msec DELAY
DELAY MMV
REC INST ASB
SEARCH
NORMAL INST
CTL DUTY MMV
ASB ON
PB/INST
CAP FG COUNTER
REC/ASB
1/2 C.D
REC AMP
REC ON
TRACKING MMV
ASB REC
PB INST
TRAPE DUTY MMV
THAPE GEN
R438 TRACKING
R435 TRACKING PRESET
TP403 CAP. SAMPLING
NON LINEAR
Q419 Q420
IC414
SYNC
From 03 VIDEO, CN13
WAVE FORM SHAPER
F-V CONV
R553 H DISCR
INV. AMP
REF 50Hz
IC420
Q415, L403 1H TUNING AMP
AC → DC D458, C459
COMPA-RATOR
NO SYNC: H
V SYNC SEP
TP422 CAP. DISCR
CAP PHASE ON: H (from MECHACON)
SP±1: H
LP±(3,5)
SP+(3,5,9) H
LP+9
IC411
H: ON
IC410
CAP FG
From 19 CAP MOTOR
CN405
CAP FG AMP1
CAP FG AMP2
X2
IC409
CAP FG COUNT DOWN
INN AMP
R505 CAP. DISCR
to MECHACON
CAP. DISCR GAIN CONTROL
IC411 H: ON
D407
D408
LIMITER
IC417
CONTROL HEAD
CN401
IC401
CTL PULSE AMP
WAVE FORM SHAPER
CONTROL PULSE COUNT DOWN
TP401 CTL PULSE
IC418
1/2 COUNT DOWN
to MECHACON
A B C D E F G H
1 2 3 4 5 6

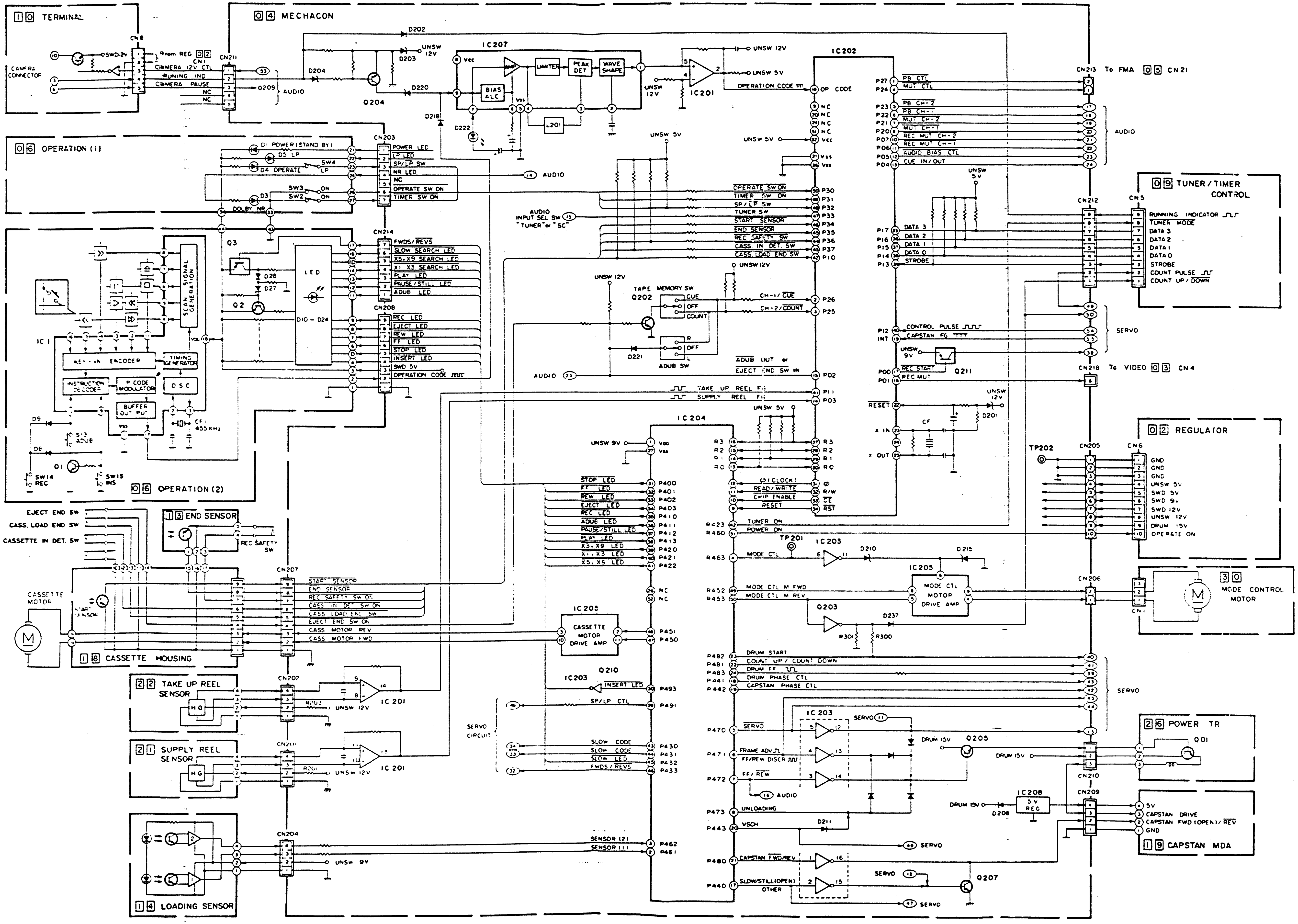


2 0 DRUM MDA
IC 1
CN406
CN2
AMP
COMP
E SW Q1
15V
LPF L1, C10
RATATION CONTROL
CN1
2 3 CN1
DRUM MOTOR CONN.
2 8 DRUM MOTOR
DRUM MOTOR
HG 1
HG 2
N
S
DRUM FF
CTL PULSE
SP
LP
Q410
Q411
IC404
SLOW TRK MMV
INV MMV
SP5V
LP5V
Q405
Q406
Q407
Q408
Q409
R449
R450
R451
R452
R453
FWD/REV
SLOW TRACKING
SP FWD SLOW TRACKING PRESET
SP REV SLOW TRACKING PRESET
LP 5V
D409
5V
LP REV SLOW TRACKING PRESET
LP FWD SLOW TRACKING PRESET
LP FWD X3 PRESET
LP REV X1 PRESET
Q402
Q403
Q404
9V
LP REV X1 L
IC 403
INST
0.5msec DELAY
REC ASB
DELAY MMV
REC
PB
INST ASB
CTL DUTY MMV
REC ON
REC AMP
R448
R447
IC 408
D463
D424
SP L
LP FWD X3 L
SP
LP FWD X3
LP REV X1 L
15V
D451
D452
D453
Q429
D444
D445
D446
Q427
D447
D448
D449
D450
Q428
IC 413
TRACKING FF
FM MAX POSITION
S/S PULSE 0
S/S PULSE 1
FM COMP
SP FM > LP FM : L
LP FM > SP FM : H
HEAD SELECT
COLOR ROTATE
SLOW/STILL
SLOW/STILL BIAS
CAP FG A
CAP FG B
CAP REV
IC405
FM MAX POS DET
IC415 (OPEN C.)
CN404
SP FM ENV
FM COMP
LP FM ENV
From 0 3 VIDEO, CN1
IC 419
D
CLK
Q
S
R
NC
SYNC
HEAD SELECT
ROTARY CTL
To 0 3 VIDEO, CN1
SLOW/STILL PULSE
SLOW/STILL
CAPSTAN DRIVE
CAPSTAN CONTROL CIRCUIT
FWD (H) / REV
CN209
CAPSTAN MDA
CAPSTAN MOTOR
M
1 9 CAPSTAN MOTOR
MECHACON SECTION
PHASE ON H
MECHACON)
IC 418
COUNT UP/DOWN (to MECHACON)
CAPSTAN FWD/REV DET
IC407
WAVE FORM SHAPER
IC406
AMP
CN407
CAP DET A
CAP DET B
From 1 9 CAP. MOTOR
H
I
J
K
M
N
O

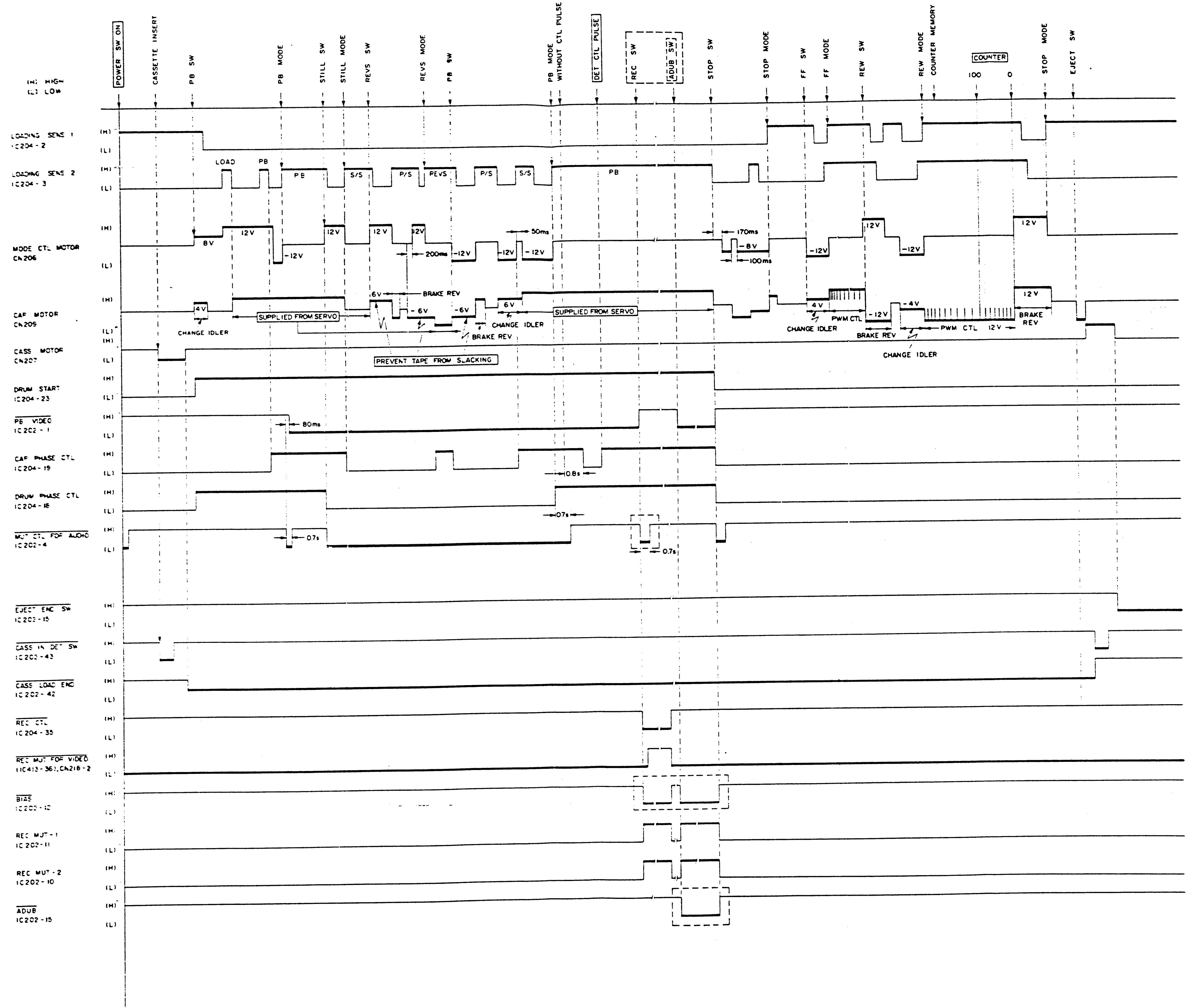
4.9 CAPSTAN AND DRUM TIMING CHARTS


RECORDING CAPSTAN SERVO MODE
PLAYBACK CAPSTAN SERVO MODE
32 768KHZ X'TAL OSC IC403-⑱
25HZ OUT INSIDE OF IC403
DELAY MM IC403-㉒
TRACKING MMV IC403-㊳
TRAPEZOID DUTY MMV IC403-㊲
TRAPEZOID IC407-㊱
SAMPLING PULSE GEN IC403-㉝
FG COUNTER OUT IC403-㉗
CTL DUTY MMV IC403-⑳
SP MODE CAPSTAN FG IN IC403-㉖
CTL PULSE IN IC403-㉕
LP MODE CAPSTAN FG IN IC 403-㉖
CTL PULSE IC401-③
RECORDING DRUM SERVO MODE
PLAYBACK DRUM SERVO MODE
V SYNC IN(50HZ) IC403-㉔
32 768KHZ X'TAL OSC IC403-⑱
1/2 CD MMV (25HZ) IC403-㉓
25HZ INSIDE OF IC403
REC PHASE MMV IC403-⑯
DRUM SAMPLING TP-7
DRUM FLIP FLOP IC403-⑫
CH1 SW PHASE MMV IC402-⑯
CH2 SW PHASE MMV IC402-⑮
DRUM PULSE IN IC402-⑰
DELAY MM IC407-㉒
IC 403-⑳
CTL DUTY MMV IC403-⑲
REC CTL CN402-1
6
5
4
3
2
1
A
B
C
E
F
G
H

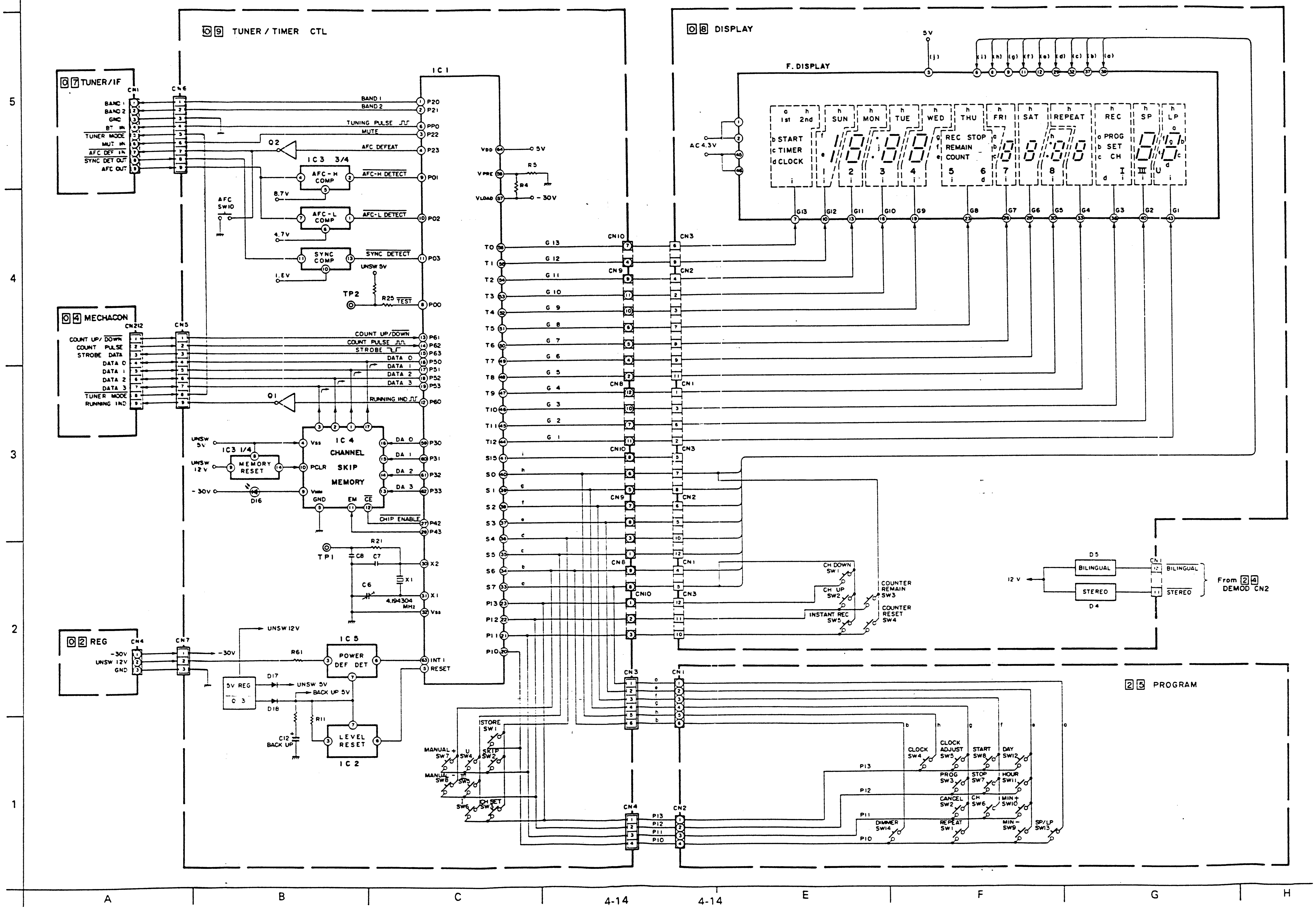
4.10 MECHANISM CONTROL BLOCK DIAGRAM


1 0 TERMINAL
CAMERA CONNECTOR
CN8
CN1
from REG 0 2
CAMERA 12V CTL
RUNING IND
CAMERA PAUSE
NC
0 4 MECHACON
CN211
D202
D203
D204
Q204
D220
UNSW 12V
IC207
Vcc
AMP
LIMITER
PEAK DET
WAVE SHAPE
BIAS ALC
Vss
L201
D218
D222
AUDIO
IC201
UNSW 12V
UNSW 5V
IC202
OPERATION CODE
OP CODE
P27
P24
PB CTL
MUT CTL
P23
P22
P21
P20
P07
P06
P05
P04
PB CH-2
PB CH-1
MUT CH-2
MUT CH-1
REC MUT CH-2
REC MUT CH-1
AUDIO BIAS CTL
CUE IN/OUT
NC
Vcc
Vss
CN213 To FMA 0 5 CN21
AUDIO
0 6 OPERATION (1)
CN203
D1 POWER (STAND BY)
D5 LP
D4 OPERATE
SW4 LP
SW3 ON
SW2 ON
D3
DOLBY NR
POWER LED
LP LED
SP/LP SW
NR LED
NC
OPERATE SW ON
TIMER SW ON
AUDIO
OPERATE SW ON
TIMER SW ON
SP/LP SW
TUNER SW
START SENSOR
END SENSOR
REC SAFETY SW
CASS IN DET SW
CASS LOAD END SW
P30
P31
P32
P33
P34
P35
P36
P37
P10
AUDIO INPUT SEL SW "TUNER" or "SC"
UNSW 5V
0 9 TUNER/TIMER CONTROL
CN212
CN5
RUNNING INDICATOR
TUNER MODE
DATA 3
DATA 2
DATA 1
DATA 0
STROBE
COUNT PULSE
COUNT UP/DOWN
P17
P16
P15
P14
P13
CN214
FWDS/REVS
SLOW SEARCH LED
X5, X9 SEARCH LED
X1 X3 SEARCH LED
PLAY LED
PAUSE/STILL LED
ADUB LED
Q3
Q2
D28
D27
LED
D10 - D24
SIGNAL GENERATION
SCAN
IC1
KEY-IN ENCODER
TIMING GENERATOR
INSTRUCTION DECODER
P CODE MODULATOR
OSC
BUFFER OUT PUT
CF1 455KHz
CN208
REC LED
EJECT LED
REW LED
FF LED
STOP LED
INSERT LED
SWD 5V
OPERATION CODE
UNSW 12V
TAPE MEMORY SW
Q202
CUE
OFF
COUNT
R
OFF
L
D221
ADUB SW
CH-1/CUE
CH-2/COUNT
P26
P25
ADUB OUT or EJECT END SW IN
P02
AUDIO
TAKE UP REEL FG
SUPPLY REEL FG
P11
P03
P12
INT
CONTROL PULSE
CAPSTAN FG
UNSW 9V
REC START
REC MUT
Q211
P00
P01
CN218 To VIDEO 0 3 CN4
SERVO
RESET
UNSW 12V
D201
CF
X IN
X OUT
D9
D8
S13 ADUB
Q1
SW14 REC
SW15 INS
0 6 OPERATION (2)
IC204
UNSW 9V
Vdd
Vss
R3
R2
R1
R0
STOP LED
FF LED
REW LED
EJECT LED
REC LED
ADUB LED
PAUSE/STILL LED
PLAY LED
X3, X9 LED
X1, X3 LED
X5, X9 LED
P400
P401
P402
P403
P410
P411
P412
P413
P420
P421
P422
S1 (CLOCK)
READ/WRITE
CHIP ENABLE
RESET
R/W
CE
RST
TUNER ON
POWER ON
R423
R460
TP202
CN205
CN6
0 2 REGULATOR
GND
UNSW 5V
SWD 5V
SWD 9V
SWD 12V
UNSW 12V
DRUM 15V
OPERATE ON
EJECT END SW
CASS. LOAD END SW
CASSETTE IN DET. SW
1 3 END SENSOR
REC SAFETY SW
TP201
IC203
MODE CTL
D210
D215
R463
IC205
MODE CTL M FWD
MODE CTL M REV
R452
R453
MODE CTL MOTOR DRIVE AMP
Q203
D237
R301
R300
CN206
CN1
3 0 MODE CONTROL MOTOR
M
CASSETTE MOTOR
START SENSOR
M
1 8 CASSETTE HOUSING
CN207
START SENSOR
END SENSOR
REC SAFETY SW ON
CASS IN DET SW ON
CASS LOAD END SW
EJECT END SW ON
CASS MOTOR REV
CASS MOTOR FWD
NC
NC
IC205
CASSETTE MOTOR DRIVE AMP
P451
P450
P487
P481
P483
P441
P442
DRUM START
COUNT UP/COUNT DOWN
DRUM FF
DRUM PHASE CTL
CAPSTAN PHASE CTL
SERVO
2 2 TAKE UP REEL SENSOR
HG
CN202
R203
UNSW 12V
IC201
Q210
IC203
INSERT LED
SP/LP CTL
P493
P491
SERVO CIRCUIT
SLOW CODE
SLOW CODE
SLOW LED
FWDS/REVS
P430
P431
P432
P433
2 1 SUPPLY REEL SENSOR
HG
CN201
R201
UNSW 12V
IC201
P470
P471
P472
P473
P443
SERVO
FRAME ADV
FF/REW DISCR
FF/REW
AUDIO
UNLOADING
VSCH
D211
DRUM 15V
Q205
DRUM 15V
2 6 POWER TR
Q01
CN210
IC208
5V REG
D206
CN209
5V
CAPSTAN DRIVE
CAPSTAN FWD (OPEN)/REV
GND
1 9 CAPSTAN MDA
SERVO
CN204
UNSW 9V
SENSOR (2)
SENSOR (1)
P462
P461
1 4 LOADING SENSOR
P480
P440
CAPSTAN FWD/REV
SLOW/STILL (OPEN) OTHER
SERVO
Q207
SERVO

4.11 MECHANISM CONTROL TIMING CHARTS

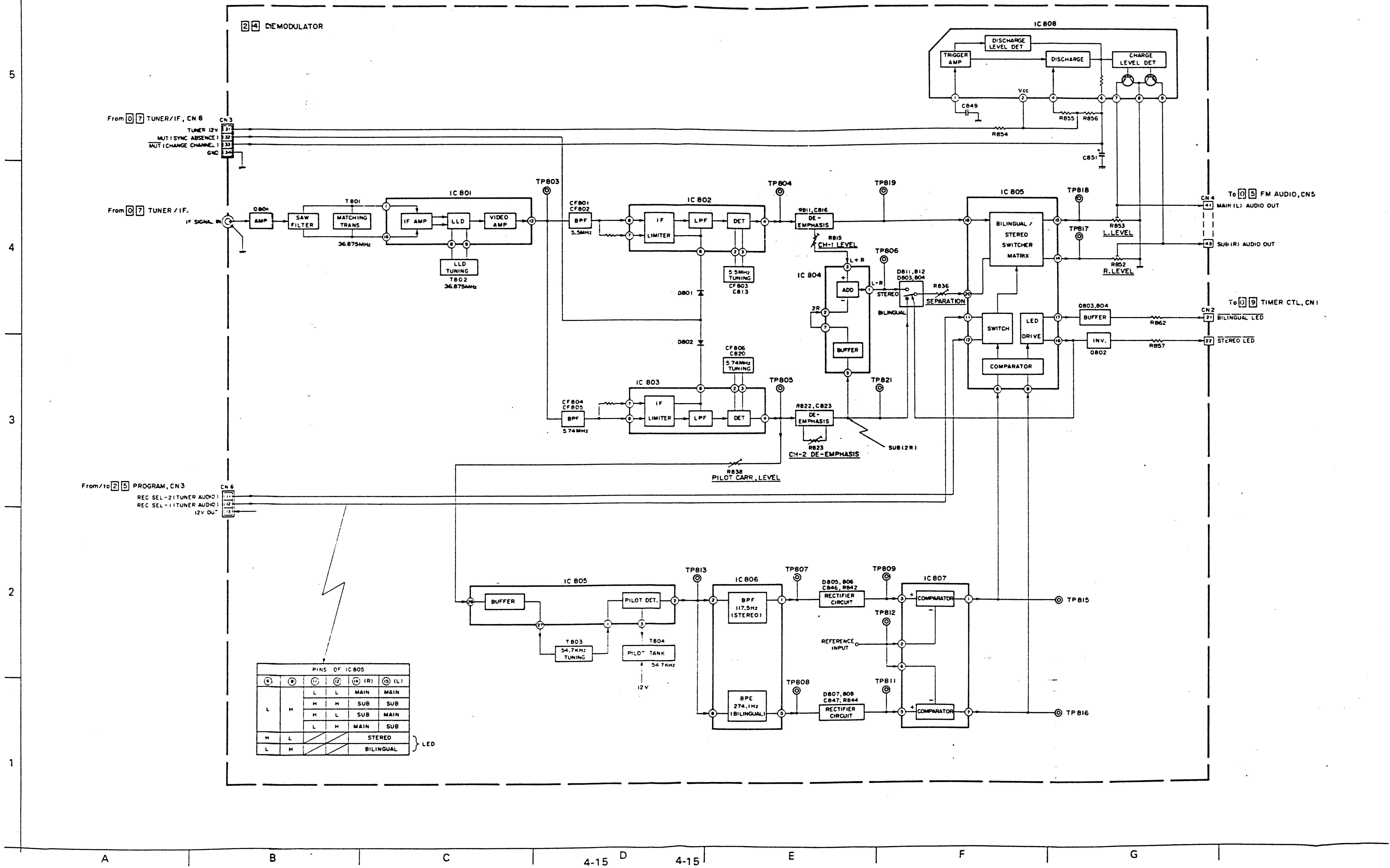

(H) HIGH
(L) LOW
POWER SW ON
CASSETTE INSERT
PB SW
PB MODE
STILL SW
STILL MODE
REVS SW
REVS MODE
PB SW
PB MODE WITHOUT CTL PULSE
DET CTL PULSE
REC SW
ADUB SW
STOP SW
STOP MODE
FF SW
FF MODE
REW SW
REW MODE
COUNTER MEMORY SW ON
COUNTER
100
0
STOP MODE
EJECT SW
LOADING SENS 1
IC204 - 2
LOADING SENS 2
IC204 - 3
LOAD
PB
P B
S/S
P/S
REVS
P/S
S/S
PB
MODE CTL MOTOR
CN206
8V
12V
-12V
12V
12V
12V
200ms
-12V
-12V
-12V
50ms
170ms
-8V
100ms
-12V
12V
-12V
12V
CAP MOTOR
CN209
4V
CHANGE IDLER
SUPPLIED FROM SERVO
6V
BRAKE REV
-6V
-6V
6V
CHANGE IDLER
BRAKE REV
PREVENT TAPE FROM SLACKING
SUPPLIED FROM SERVO
4V
PWM CTL
CHANGE IDLER
-12V
BRAKE REV
-4V
PWM CTL
12V
CHANGE IDLER
12V
BRAKE REV
CASS MOTOR
CN207
DRUM START
IC204 - 23
PB VIDEO
IC202 - 1
80ms
CAP PHASE CTL
IC204 - 19
0.8s
DRUM PHASE CTL
IC204 - 18
0.7s
MUT CTL FOR AUDIO
IC202 - 4
0.7s
0.7s
EJECT END SW
IC202 - 15
CASS IN DET SW
IC202 - 43
CASS LOAD END
IC202 - 42
REC CTL
IC204 - 35
REC MUT FOR VIDEO
(IC413 - 36), CN216 - 2
BIAS
IC202 - 12
REC MUT - 1
IC202 - 11
REC MUT - 2
IC202 - 10
ADUB
IC202 - 15
6
5
4
3
2
1
A
B
C
E
F
G
H

4.12 TUNER/TIMER CTL, DISPLAY AND PROGRAM BLOCK DIAGRAMS



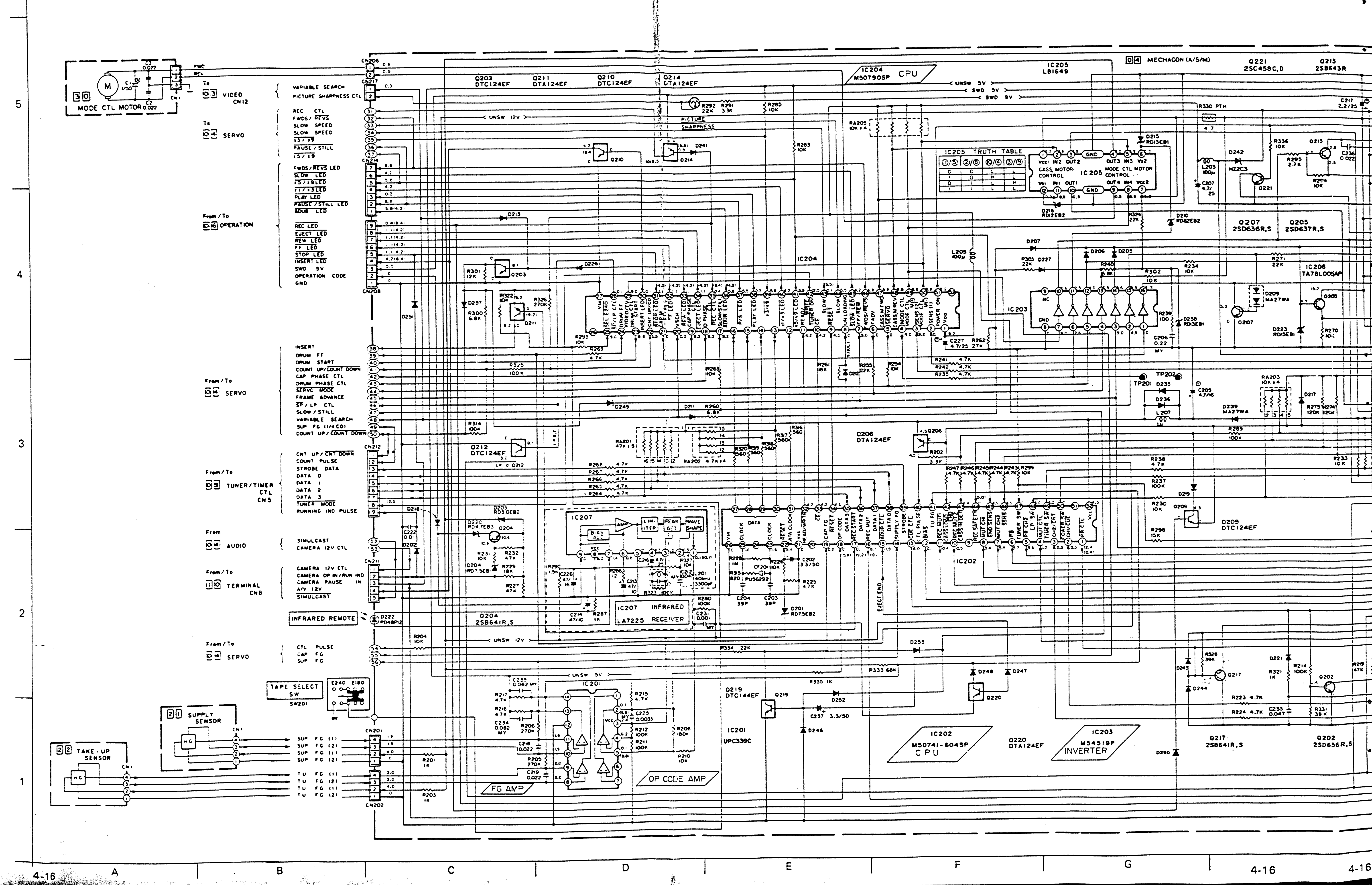
09 TUNER / TIMER CTL
08 DISPLAY
07 TUNER/IF
04 MECHACON
02 REG
25 PROGRAM
IC1
IC3 3/4
AFC-H COMP
AFC-L COMP
SYNC COMP
AFC SW10
TP2
IC4 CHANNEL SKIP MEMORY
IC3 1/4 MEMORY RESET
D16
TP1
4.194304 MHz
IC5 POWER DEF DET
5V REG Q3
IC2 LEVEL RESET
BACK UP
F. DISPLAY
AC 4.3V
1st 2nd SUN MON TUE WED THU FRI SAT REPEAT REC SP LP
START
TIMER
CLOCK
REC STOP
REMAIN
COUNT
PROG
SET
CH
BILINGUAL
STEREO
From 24 DEMOD CN2
12 V
CH DOWN SW1
CH UP SW2
INSTANT REC SW5
COUNTER REMAIN SW3
COUNTER RESET SW4
STORE SW1
SKIP SW2
CH SET SW3
MANUAL + SW7
MANUAL − SW8
CLOCK SW4
CLOCK ADJUST SW5
START SW8
DAY SW12
PROG SW3
STOP SW7
HOUR SW11
CANCEL SW2
CH SW6
MIN + SW10
DIMMER SW14
REPEAT SW1
MIN − SW9
SP/LP SW13
6
5
4
3
2
1
A
B
C
E
F
G
H

4.13 DEMODULATOR BLOCK DIAGRAM


2 4 DEMODULATOR
From 0 7 TUNER/IF, CN 8
CN 3
TUNER 12V 31
MUT (SYNC ABSENCE) 32
MUT (CHANGE CHANNEL) 33
GND 34
From 0 7 TUNER / IF.
IF SIGNAL IN
Q804
AMP
SAW FILTER
T801
MATCHING TRANS
36.875MHz
IC 801
IF AMP
LLD
VIDEO AMP
LLD TUNING
T802
36.875MHz
TP803
CF801
CF802
BPF
5.5MHz
IC 802
IF LIMITER
LPF
DET
5.5MHz TUNING
CF803
C813
D801
D802
CF806
C820
5.74MHz TUNING
IC 803
IF LIMITER
LPF
DET
CF804
CF805
BPF
5.74MHz
TP804
R811, C816
DE-EMPHASIS
R815
CH-1 LEVEL
TP819
TP806
L+R
IC 804
ADD
L-R
2R
BUFFER
STEREO
BILINGUAL
D811, 812
D803, 804
R836
SEPARATION
TP805
R822, C823
DE-EMPHASIS
R823
CH-2 DE-EMPHASIS
TP821
SUB (2R)
R838
PILOT CARR. LEVEL
IC 808
DISCHARGE LEVEL DET
TRIGGER AMP
DISCHARGE
CHARGE LEVEL DET
Vcc
C849
R854
R855
R856
C851
IC 805
BILINGUAL / STEREO SWITCHER MATRIX
SWITCH
LED DRIVE
COMPARATOR
TP818
TP817
R853
L.LEVEL
R852
R.LEVEL
To 0 5 FM AUDIO, CN5
CN 4
41 MAIN (L) AUDIO OUT
43 SUB (R) AUDIO OUT
Q803, 804
BUFFER
R862
INV.
Q802
R857
To 0 9 TIMER CTL, CN1
CN 2
21 BILINGUAL LED
22 STEREO LED
From/to 2 5 PROGRAM, CN3
CN 6
REC SEL-2 (TUNER AUDIO) 11
REC SEL-1 (TUNER AUDIO) 12
12V OUT 13
IC 805
BUFFER
PILOT DET.
T803
54.7KHz TUNING
T804
PILOT TANK
54.7KHz
12V
TP813
IC 806
BPF
117.5Hz
(STEREO)
BPE
274.1Hz
(BILINGUAL)
TP807
D805, 806
C846, R842
RECTIFIER CIRCUIT
TP809
TP812
REFERENCE INPUT
TP808
D807, 808
C847, R844
RECTIFIER CIRCUIT
TP811
IC 807
COMPARATOR
COMPARATOR
TP815
TP816
LED
6
5
4
3
2
1
A
B
C
D
E
F
G

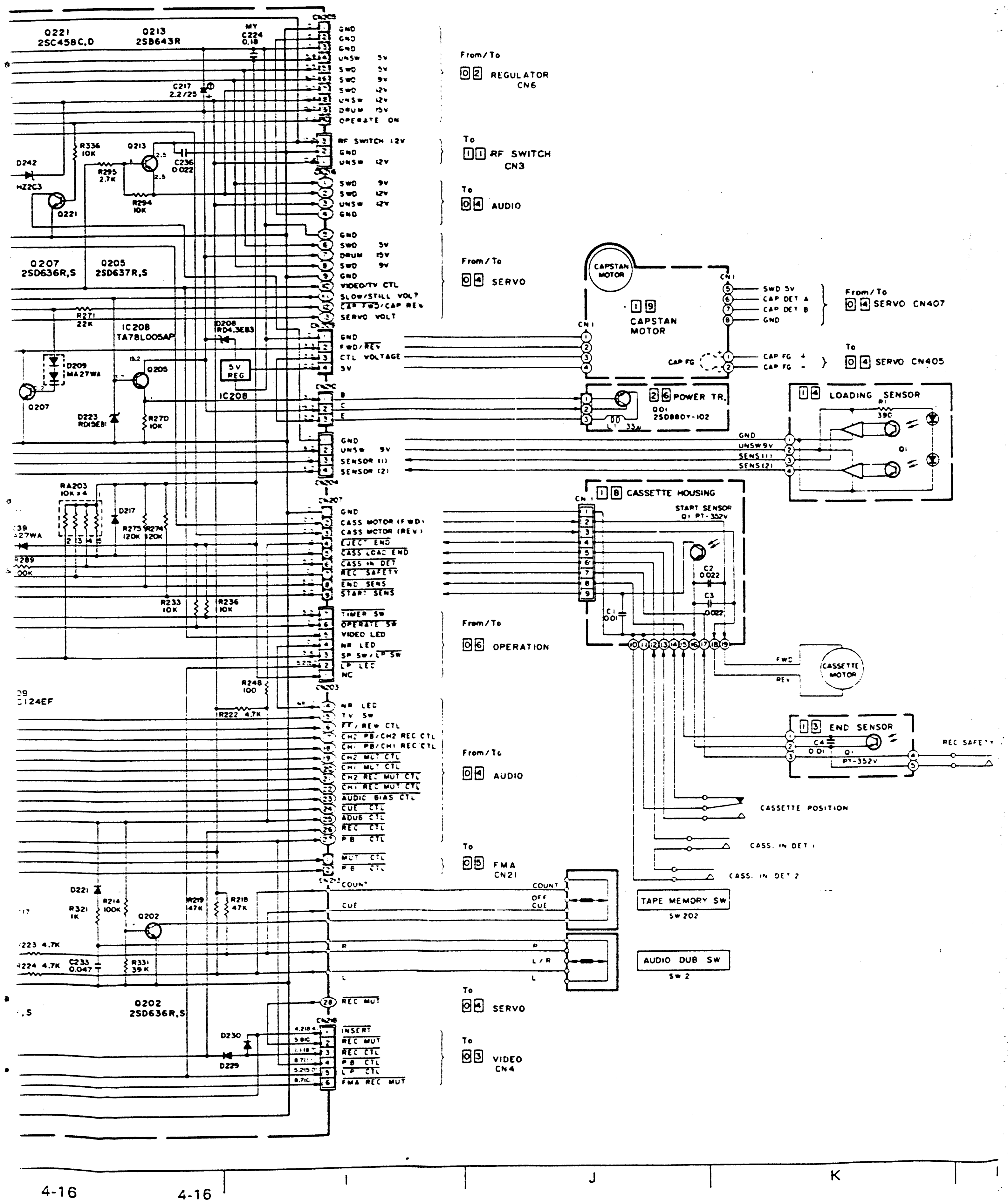
PINS OF IC 805					
⑥	⑧	⑪	⑫	⑭ (R)	⑮ (L)
L	H	L	L	MAIN	MAIN
		H	H	SUB	SUB
		H	L	SUB	MAIN
		L	H	MAIN	SUB
H	L			STEREO	
L	H			BILINGUAL	

4.14 MECHANISM CONTROL (A/S/M) SCHEMATIC DIAGRAM


MODE CTL MOTOR
VIDEO CN12
SERVO
OPERATION
TUNER/TIMER CTL CN5
AUDIO
TERMINAL CN8
INFRARED REMOTE
TAPE SELECT SW SW201
SUPPLY SENSOR
TAKE-UP SENSOR
IC204 M50790SP CPU
IC205 LB1649
IC205 TRUTH TABLE
IC203
IC202
IC207 INFRARED LA7225 RECEIVER
IC201 UPC339C
FG AMP
OP CODE AMP
IC202 M50741-604SP CPU
IC203 M54519P INVERTER
IC206 TA78L005AP
MECHACON (A/S/M)
Q203 DTC124EF
Q211 DTA124EF
Q210 DTC124EF
Q214 DTA124EF
Q212 DTC124EF
Q204 2SB641R,S
Q206 DTA124EF
Q209 DTC124EF
Q219 DTC144EF
Q220 DTA124EF
Q217 2SB641R,S
Q202 2SD636R,S
Q221 2SC458C,D
Q213 2SB643R
Q207 2SD636R,S
Q205 2SD637R,S
UNSW 12V
UNSW 5V
SWD 5V
SWD 9V
1
2
3
4
5
6
A
B
C
D
E
F
G

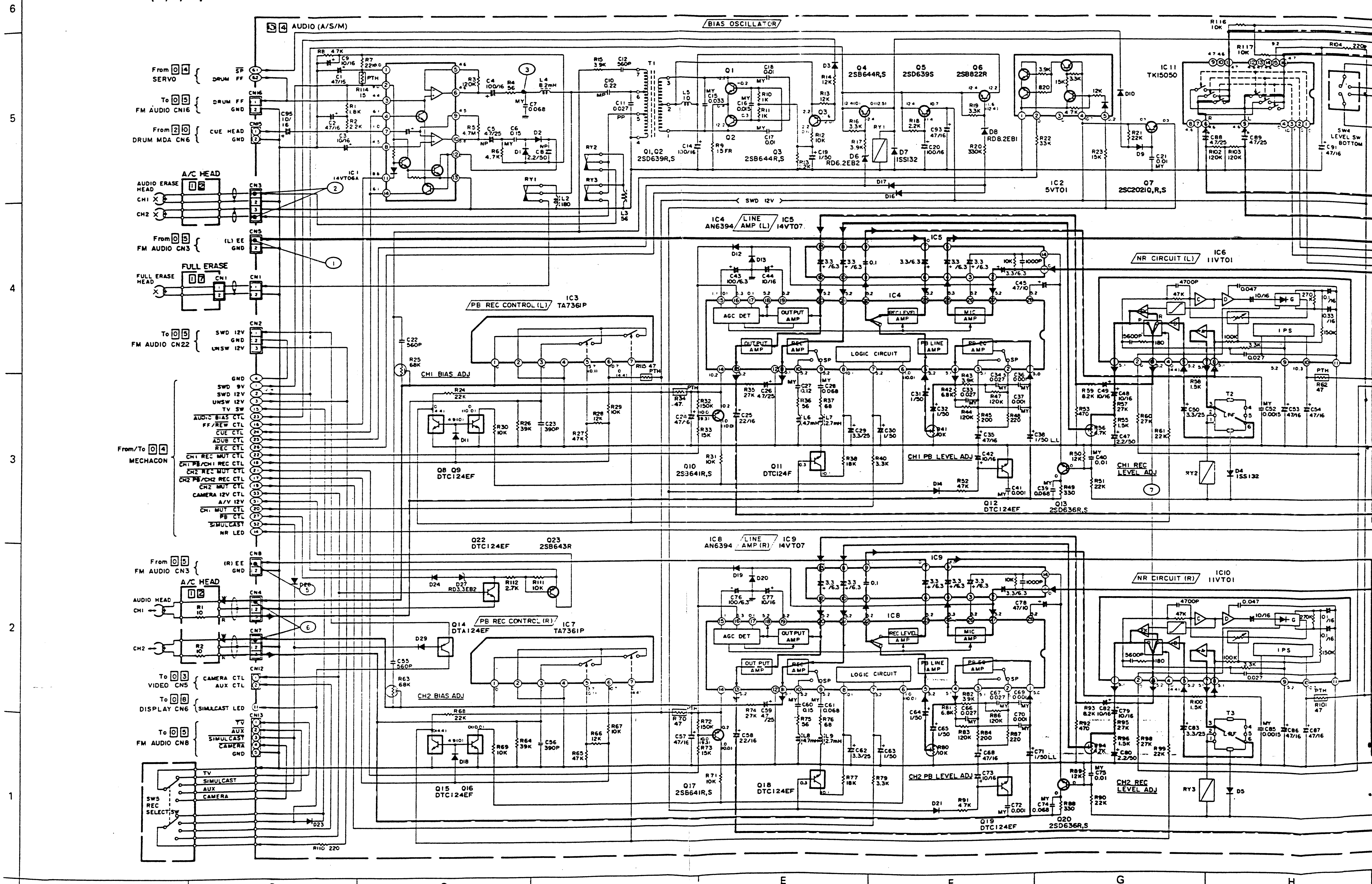
-IACON MECHACON

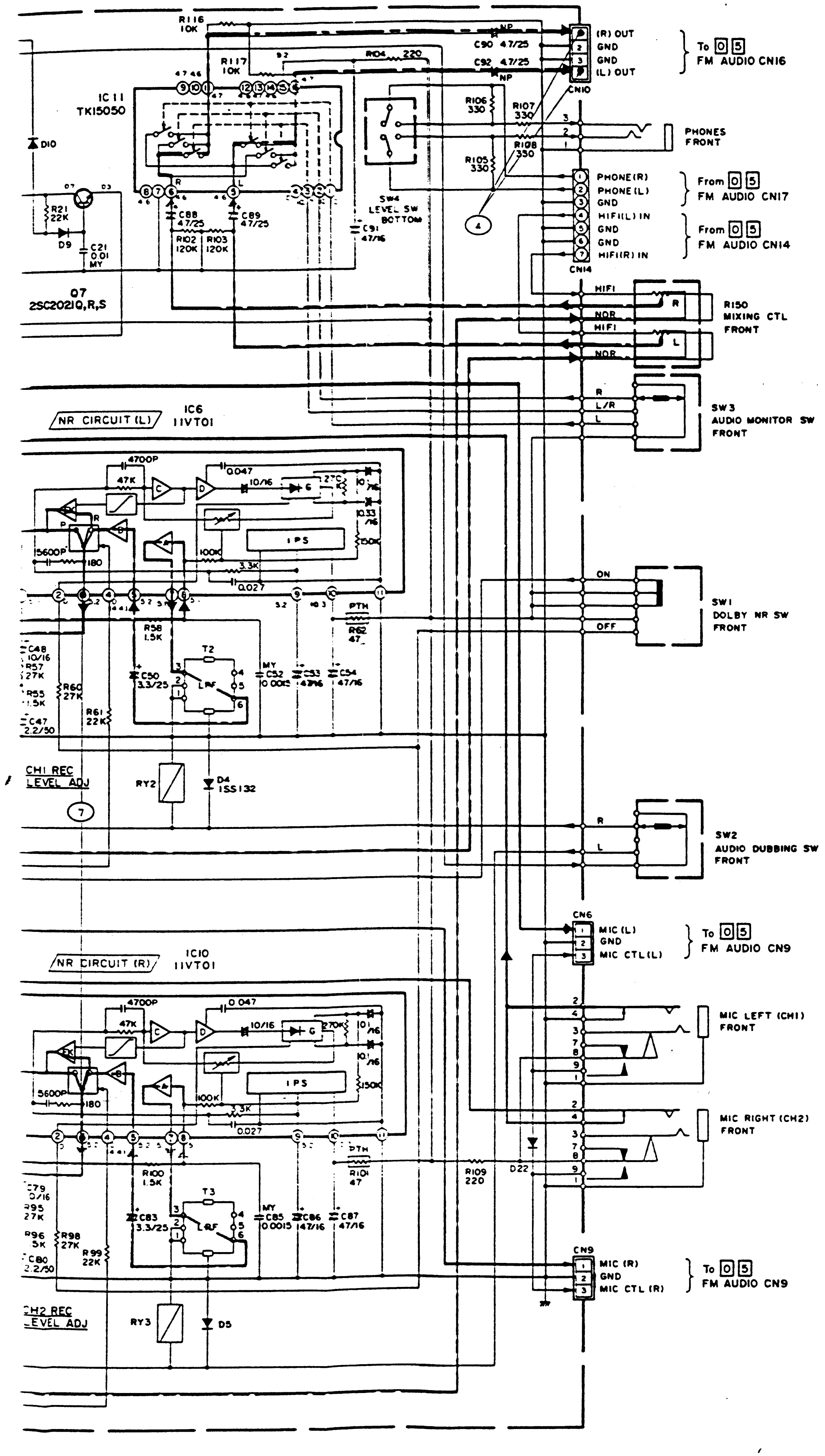
NOTES: Unless otherwise specified.
1. All resistance values are in ohms. (1/6 W).
2. All inductance values are in μH.
3. All capacitance values are in μF.
4. All diodes are 1SS133
5. Voltages are DC-measured with a digital voltmeter during stop mode.
6. Shaded (......) parts are critical for safety. Replace only with specified part numbers.



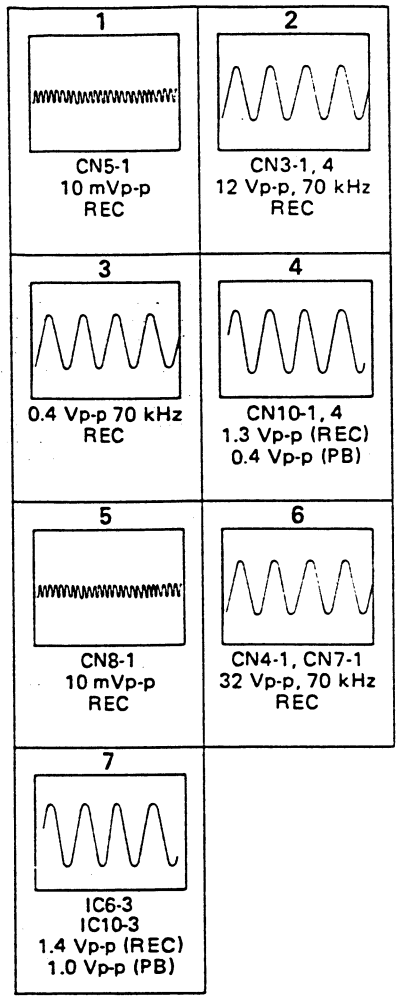
Q221 2SC458C,D
Q213 2SB643R
C224 0.18
C217 2.2/25
R336 10K
R295 2.7K
R294 10K
C236 0.022
D242
HZ2C3
Q207 2SD636R,S
Q205 2SD637R,S
R271 22K
IC208 TA78L005AP
D208 RD4.3EB3
5V REG
D209 MA27WA
D223 RD15EB
R270 10K
RA203 10K×4
D217
R275 120K
R274 120K
R289
R233 10K
R236 10K
R248 100
R222 4.7K
D221
R321 1K
R214 100K
Q202
R219 47K
R218 47K
C233 0.047
R331 39K
Q202 2SD636R,S
D230
D229
GND
UNSW 5V
SWD 5V
SWD 9V
SWD 12V
UNSW 12V
DRUM 13V
OPERATE ON
RF SWITCH 12V
VIDEO/TV CTL
SLOW/STILL VOLT
CAP FWD/CAP REV
SERVO VOLT
FWD/REV
CTL VOLTAGE
SENSOR (1)
SENSOR (2)
CASS MOTOR (FWD)
CASS MOTOR (REV)
EJECT END
CASS LOAD END
CASS IN DET
REC SAFETY
END SENS
START SENS
TIMER SW
OPERATE SW
VIDEO LED
NR LED
SP SW/LP SW
LP LED
NC
TV SW
FF/REW CTL
CH2 PB/CH2 REC CTL
CH1 PB/CH1 REC CTL
CH2 MUT CTL
CH1 MUT CTL
CH2 REC MUT CTL
CH1 REC MUT CTL
AUDIO BIAS CTL
CUE CTL
ADUB CTL
REC CTL
PB CTL
MUT CTL
COUNT
CUE
REC MUT
INSERT
LP CTL
FMA REC MUT
From/To 02 REGULATOR CN6
To 11 RF SWITCH CN3
To 04 AUDIO
From/To 04 SERVO
From/To 06 OPERATION
From/To 04 AUDIO
To 05 FMA CN21
To 04 SERVO
To 03 VIDEO CN4
CAPSTAN MOTOR
19 CAPSTAN MOTOR
CN1
SWD 5V
CAP DET A
CAP DET B
CAP FG
From/To 04 SERVO CN407
To 04 SERVO CN405
26 POWER TR.
Q01 2SD880Y-102
L1 33μ
14 LOADING SENSOR
R1 390
Q1
UNSW9V
SENS(1)
SENS(2)
18 CASSETTE HOUSING
START SENSOR
Q1 PT-352V
C2 0.022
C3 0.022
C1 0.01
FWD
REV
CASSETTE MOTOR
13 END SENSOR
C4 0.01
PT-352V
REC SAFETY
CASSETTE POSITION
CASS. IN DET 1
CASS. IN DET 2
OFF
R
L/R
L
TAPE MEMORY SW
SW 202
AUDIO DUB SW
SW 2
I
J
K

4.15 AUDIO (A/S/M) SCHEMATIC DIAGRAM


6
5
4
3
2
1
A
B
C
D
E
F
G
H
AUDIO (A/S/M)
BIAS OSCILLATOR
From 04 SERVO
SP
DRUM FF
To 05 FM AUDIO CN16
DRUM FF
GND
From 20 DRUM MDA CN6
CUE HEAD
GND
A/C HEAD
AUDIO ERASE HEAD
CH1
CH2
From 05 FM AUDIO CN3
(L) EE
GND
FULL ERASE
FULL ERASE HEAD
To 05 FM AUDIO CN22
SWD 12V
GND
UNSW 12V
From/To 04 MECHACON
GND
SWD 9V
SWD 12V
UNSW 12V
TV SW
AUDIO BIAS CTL
FF/REW CTL
CUE CTL
ADUB CTL
REC CTL
CH1 REC MUT CTL
CH1 PB/CH1 REC CTL
CH2 REC MUT CTL
CH2 PB/CH2 REC CTL
CH2 MUT CTL
CAMERA 12V CTL
A/V 12V
CH1 MUT CTL
PB CTL
SIMULCAST
NR LED
From 05 FM AUDIO CN3
(R) EE
GND
A/C HEAD
AUDIO HEAD
CH1
CH2
R1 10
R2 10
To 03 VIDEO CN5
CAMERA CTL
AUX CTL
To 08 DISPLAY CN6
SIMULCAST LED
To 05 FM AUDIO CN8
TV
AUX
SIMULCAST
CAMERA
GND
SW5 REC SELECT SW
TV
SIMULCAST
AUX
CAMERA
R110 220
D23
CN16
CN15
CN3
CN5
CN1
CN2
CN8
CN4
CN7
CN12
CN13
C95 10/16
R8 4.7K
C9 10/16
R7 2200
PTH
C1 47/16
R114 15
R1 1.8K
C2 47/16
R2 2.2K
C3 10/16
IC1 14VT06A
R3 120K
C4 100/16
R4 56
L4 8.2mH
C7 0.068
R5 4.7M
C5 47/25
C6 0.15
D2
R6 4.7K
D1
C8 2.2/50
NP
MY
R15 3.9K
C12 560P
T1
C10 0.22
MP
C11 0.027
PP
RY2
RY3
RY1
L2 180
L3 56
L5 10
C15 0.033
C14 100/16
Q1
Q2
Q1, Q2 2SD639R,S
C18 0.01
R10 1K
C16 0.015
R11 1K
C17 0.01
R9 15 FR
Q3 2SB644R,S
D3
R14 12K
R13 12K
R12 10K
C19 1/50
R13 2.2K
Q4 2SB644R,S
Q5 2SD639S
Q6 2SB822R
R16 3.3K
R17 3.9K
D6 RD6.2EB2
RY1
D7 1SS132
R18 2.2K
C93 47/16
C20 100/16
R19 3.3K
D8 RD8.2EB1
R20 330K
D17
D16
SWD 12V
3.9K
820
15K
3.3K
4.7K
12K
R22 33K
IC2 5VT01
D10
R21 22K
R23 15K
D9
C21 0.01
Q7 2SC2021Q,R,S
IC11 TK15050
R116 10K
R117 10K
R104 220
C88 47/25
C89 47/25
R102 120K
R103 120K
SW4 LEVEL SW BOTTOM
C91 47/16
IC4 AN6394
LINE AMP (L)
IC5 14VT07
IC5
D12
D13
C43 100/6.3
C44 10/16
3.3 /6.3
0.1
3.3/6.3
10K
1000P
C45 47/10
IC4
AGC DET
OUTPUT AMP
REC LEVEL AMP
MIC AMP
OUTPUT AMP
REC AMP
LOGIC CIRCUIT
PB LINE AMP
PB EQ AMP
SP
NR CIRCUIT (L)
IC6 11VT01
4700P
47K
0.047
10/16
270K
0.33/16
5600P
180
100K
3.3K
0.027
IPS
150K
PB REC CONTROL (L)
IC3 TA7361P
R115 47
PTH
C22 560P
R25 68K
CH1 BIAS ADJ
R24 22K
R30 10K
R26 39K
C23 390P
R27 47K
R28 12K
R29 10K
D11
Q8 Q9 DTC124EF
PTH
R34 47
R32 150K
C24 47/16
R33 15K
R31 10K
Q10 2SD641R,S
C25 22/16
R35 27K
C26 47/25
C27 0.12
C28 0.068
R36 56
R37 68
L6 4.7mH
L7 12.7mH
C29 3.3/25
C30 1/50
Q11 DTC124F
R38 18K
R40 3.3K
C31 1/50
C32 1/50
R41 10K
R42 6.8K
R43 3.9K
C33 0.027
C34 0.027
C36 0.001
R44 120K
R47 120K
C37 0.001
R45 200
R48 220
C35 47/16
C38 1/50
CH1 PB LEVEL ADJ
C42 10/16
D14
R52 47K
C41 0.001
Q12 DTC124EF
R59 8.2K
C49 10/16
C48 10/16
R57 27K
R53 470
R56 4.7K
R55 1.5K
C47 2.2/50
R60 27K
R61 22K
R58 1.5K
C50 3.3/25
T2
C52 0.0015
C53 47/16
C54 47/16
R62 47
PTH
R50 12K
C40 0.01
R51 22K
C39 0.068
R49 330
Q13 2SD636R,S
CH1 REC LEVEL ADJ
RY2
D4 1SS132
Q22 DTC124EF
Q23 2SB643R
D26
D24
D27 RD3.3EB2
R112 2.7K
R111 10K
IC8 AN6394
LINE AMP (R)
IC9 14VT07
IC9
D19
D20
C76 100/6.3
C77 10/16
IC8
C78 47/10
NR CIRCUIT (R)
IC10 11VT01
PB REC CONTROL (R)
IC7 TA7361P
Q14 DTA124EF
D29
C55 560P
R63 68K
CH2 BIAS ADJ
R68 22K
R69 10K
R64 39K
C56 390P
R65 47K
R66 12K
R67 10K
D18
Q15 Q16 DTC124EF
R70 47
R72 150K
C57 47/16
R73 15K
R71 10K
Q17 2SD641R,S
C58 22/16
R74 27K
C59 47/25
C60 0.15
C61 0.068
R75 56
R76 68
L8 4.7mH
L9 12.7mH
C62 3.3/25
C63 1/50
Q18 DTC124EF
R77 18K
R79 3.3K
C64 1/50
C65 1/50
R80 10K
R81 6.8K
R82 3.9K
C66 0.027
C67 0.027
C69 0.001
R83 120K
R86 120K
C70 0.001
R84 200
R87 220
C68 47/16
C71 1/50
CH2 PB LEVEL ADJ
C73 10/16
D21
R91 4.7K
C72 0.001
Q19 DTC124EF
R93 8.2K
C82 10/16
C79 10/16
R95 27K
R92 470
R94 4.7K
R96 1.5K
C80 2.2/50
R98 27K
R99 22K
R100 1.5K
C83 3.3/25
T3
C85 0.0015
C86 47/16
C87 47/16
R101 47
PTH
R89 12K
C75 0.01
R90 22K
C74 0.068
R88 330
Q20 2SD636R,S
CH2 REC LEVEL ADJ
RY3
D5
①
②
③
⑤
⑥
⑦


R116 10K
R117 10K
IC11 TK15050
D10
Q7 2SC2021Q,R,S
R21 22K
D9
C21 0.01 MY
C88 47/25
C89 47/25
R102 120K
R103 120K
R104 220
C90 47/25
C92 47/25
NP
(R) OUT
GND
GND
(L) OUT
CN10
To 05 FM AUDIO CN16
R106 330
R107 330
R105 330
R108 330
PHONES FRONT
SW4 LEVEL SW BOTTOM
C91 47/16
PHONE(R)
PHONE(L)
GND
HIFI(L) IN
GND
GND
HIFI(R) IN
CN14
From 05 FM AUDIO CN17
From 05 FM AUDIO CN14
HIFI
NOR
R150 MIXING CTL FRONT
L/R
SW3 AUDIO MONITOR SW FRONT
NR CIRCUIT (L)
IC6 11VT01
4700P
47K
0.047
10/16
5600P
180
100K
3.3K
0.027
IPS
150K
PTH
R62 47
R58 1.5K
T2
LPF
C50 3.3/25
C52 0.0015
C53 47/16
C54 47/16
C48 10/16
R57 27K
R55 1.5K
R60 27K
R61 22K
C47 2.2/50
CH1 REC LEVEL ADJ
RY2
D4 1SS132
ON
OFF
SW1 DOLBY NR SW FRONT
SW2 AUDIO DUBBING SW FRONT
CN6
MIC (L)
GND
MIC CTL(L)
To 05 FM AUDIO CN9
NR CIRCUIT (R)
IC10 11VT01
MIC LEFT (CH1) FRONT
MIC RIGHT (CH2) FRONT
R100 1.5K
T3
C83 3.3/25
C85 0.0015
C86 47/16
C87 47/16
R101 47
R109 220
D22
C79 10/16
R95 27K
R96 1.5K
R98 27K
R99 22K
C80 2.2/50
CH2 REC LEVEL ADJ
RY3
D5
CN9
MIC (R)
GND
MIC CTL (R)
To 05 FM AUDIO CN9

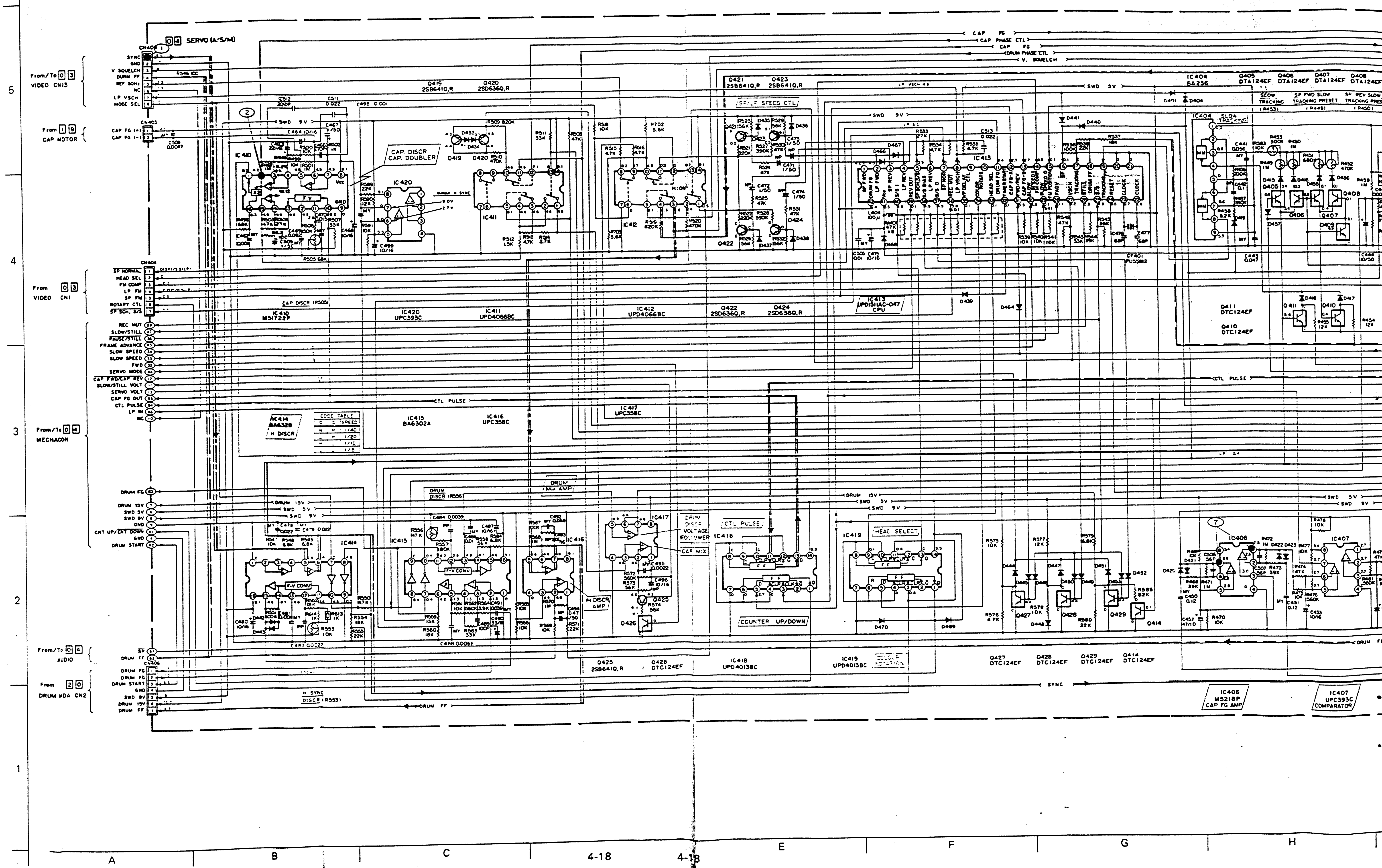
Waveforms of audio circuit

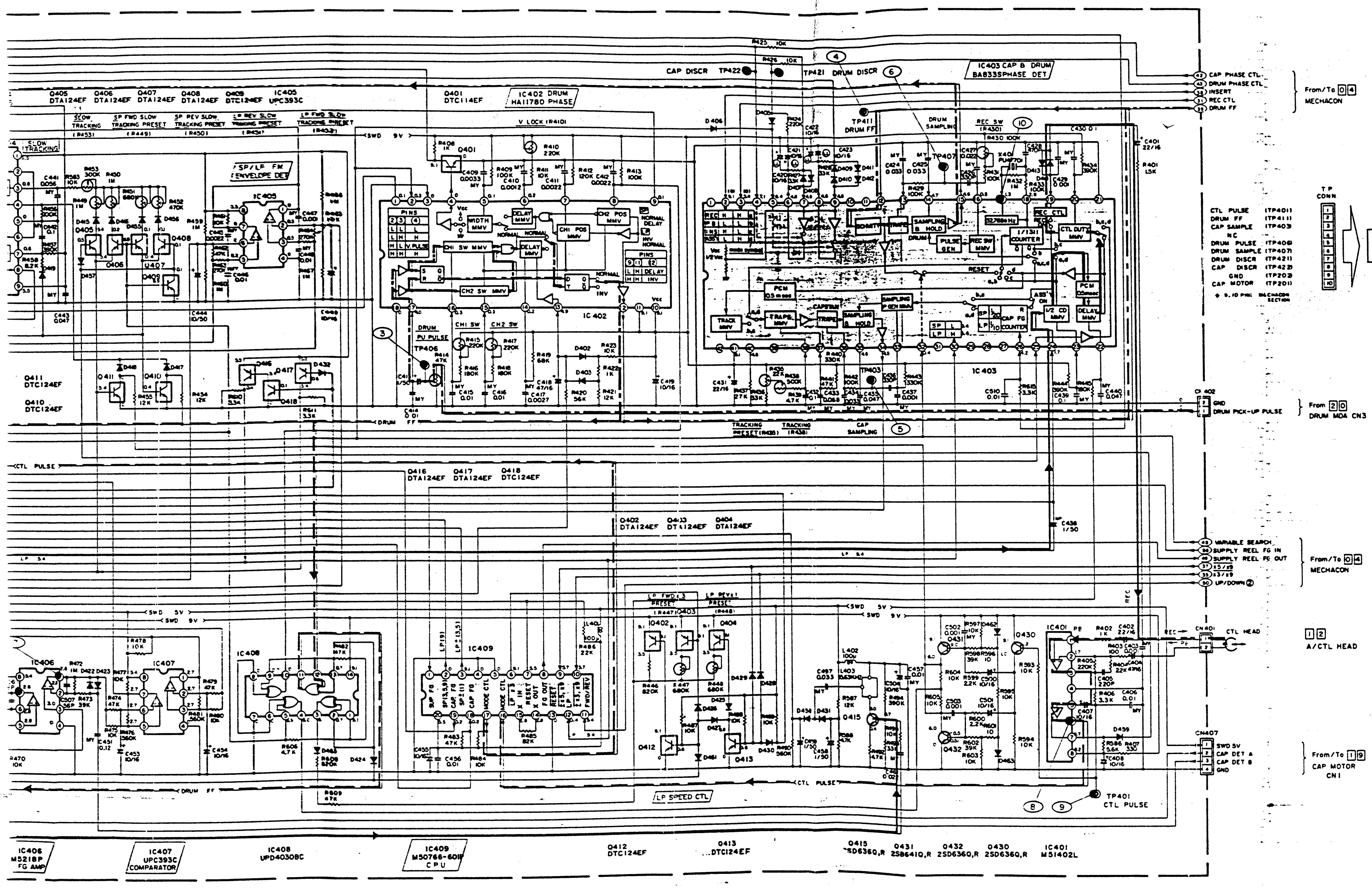


NOTES: Unless otherwise specified,

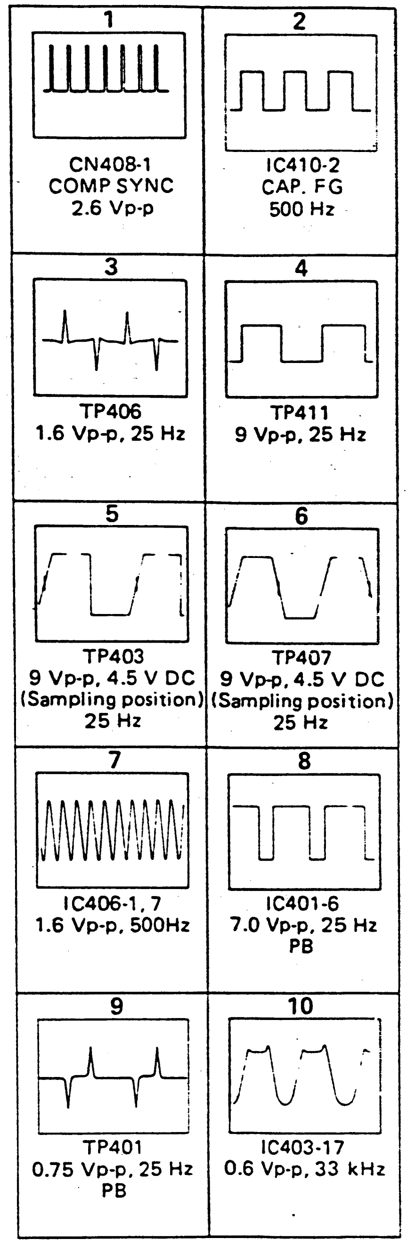
1. All resistance values are in ohms. (1/6 W).
2. All inductance values are in μH.
3. All capacitance values are in μF.
4. All diodes are 1SS133
5. Voltages are DC-measured with a digital voltmeter during recording mode.
6. Where voltage differs between recording and playback, the voltage during playback is shown in parentheses.
7. Shaded ( ) parts are critical for safety. Replace only with specified part numbers.
8. Waveforms are measured with 1 kHz (−20dBs) during recording and playback with alignment tape (1 kHz).

4.16 SERVO (A/S/M) SCHEMATIC DIAGRAM


04 SERVO (A/S/M)
CN405
From/To 03 VIDEO CN13
SYNC
GND
V SQUELCH
DURM FF
REF 50Hz
NC
LP VSCH
MODE SEL
From 19 CAP MOTOR
CAP FG (+)
CAP FG (-)
CN404
From 03 VIDEO CN1
SP NORMAL
HEAD SEL
FM COMP
LP FM
SP FM
ROTARY CTL
SP SCH, S/S
From/To 04 MECHACON
REC MUT
SLOW/STILL
PAUSE/STILL
FRAME ADVANCE
SLOW SPEED
SLOW SPEED
FWD
SERVO MODE
CAP FWD/CAP REV
SLOW/STILL VOLT
SERVO VOLT
CAP FG OUT
CTL PULSE
LP IN
NC
DRUM FG
DRUM 15V
SWD 5V
SWD 9V
GND
CNT UP/CNT DOWN
GND
DRUM START
From/To 04 AUDIO
SP
DRUM FF
CN406
From 20 DRUM MDA CN2
DRUM FG
DRUM FG
DRUM START
GND
SWD 9V
DRUM 15V
DRUM FF
CAP FG
CAP PHASE CTL
CAP FG
DRUM PHASE CTL
V. SQUELCH
SWD 5V
SWD 9V
CAP DISCR CAP. DOUBLER
CAP DISCR (R506)
IC410 M51722P
IC420 UPC393C
IC411 UPD4066BC
IC412 UPD4066BC
Q419 2SB6410,R
Q420 2SD6360,R
Q421 2SB6410,R
Q423 2SB6410,R
Q422 2SD6360,R
Q424 2SD6360,R
SEMI-F SPEED CTL
IC413 UPD1511AC-047 CPU
CF401 PU55812
IC404 BA236
Q405 DTA124EF
Q406 DTA124EF
Q407 DTA124EF
Q408 DTA124EF
SLOW TRACKING (R453)
SP FWD SLOW TRACKING PRESET (R449)
SP REV SLOW TRACKING PRESET (R450)
Q411 DTC124EF
Q410 DTC124EF
CTL PULSE
IC414 BA6328 H DISCR
CODE TABLE
IC415 BA6302A
IC416 UPC358C
IC417 UPC358C
F-V CONV
DRUM DISCR (R556)
DRUM / MIX AMP
DRUM DISCR VOLTAGE FOLLOWER
CAP MIX
H DISCR AMP
CTL PULSE
IC418
COUNTER UP/DOWN
IC419
HEAD SELECT
Q425 2SB6410,R
Q426 DTC124EF
IC418 UPD4013BC
IC419 UPD4013BC
COLOUR ROTATION
Q427 DTC124EF
Q428 DTC124EF
Q429 DTC124EF
Q414 DTC124EF
IC406
IC407
IC406 M5218P CAP FG AMP
IC407 UPC393C COMPARATOR
SYNC
H SYNC DISCR (R553)
DRUM FF
1
2
3
4
5
6
A
B
C
E
F
G
H


IC403 CAP & DRUM BA833SPHASE DET
IC402 DRUM HA11780 PHASE
IC405 UPC393C
SP/LP FM ENVELOPE DET
CAP DISCR TP422
TP421 DRUM DISCR
TP411 DRUM FF
TP407
TP406
TP403
TP401 CTL PULSE
IC406 M5218P FG AMP
IC407 UPC393C COMPARATOR
IC408 UPD4030BC
IC409 M50766-601P CPU
IC401 M51402L
0412 DTC124EF
0413 DTC124EF
0415 2SD636Q,R
0431 2SB641Q,R
0432 2SD636Q,R
0430 2SD636Q,R
0405 DTA124EF
0406 DTA124EF
0407 DTA124EF
0408 DTA124EF
0409 DTC124EF
0401 DTC114EF
0411 DTC124EF
0410 DTC124EF
0416 DTA124EF
0417 DTA124EF
0418 DTC124EF
0402 DTA124EF
0403 DTA124EF
0404 DTA124EF
LP SPEED CTL
CTL PULSE
DRUM FF
SWD 5V
SWD 9V
CAP PHASE CTL
DRUM PHASE CTL
INSERT
REC CTL
DRUM FF
From/To 0 4 MECHACON
T.P CONN
SERVO CHECKER
CTL PULSE (TP401)
DRUM FF (TP411)
CAP SAMPLE (TP403)
NC
DRUM PULSE (TP406)
DRUM SAMPLE (TP407)
DRUM DISCR (TP421)
CAP DISCR (TP422)
GND (TP202)
CAP MOTOR (TP201)
CN402
GND
DRUM PICK-UP PULSE
From 2 0 DRUM MDA CN3
VARIABLE SEARCH
SUPPLY REEL FG IN
SUPPLY REEL FG OUT
From/To 0 4 MECHACON
CN401
CTL HEAD
1 2 A/CTL HEAD
CN407
SWD 5V
CAP DET A
CAP DET B
GND
From/To 1 9 CAP MOTOR CN1

Waveforms of servo circuit

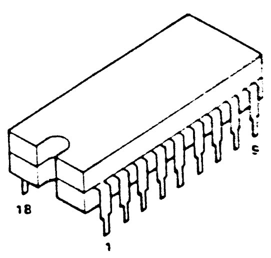


NOTES: Unless otherwise specified,

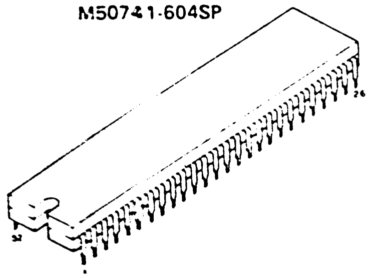
1. All resistance values are in ohms. (1/6 W)
2. All inductance values are in μH.
3. All capacitance values are in μF.
4. All diodes are 1SS133
5. Voltages are DC-measured with a digital voltmeter during recording (SP mode)
6. Where voltage differs between recording (SP mode) and playback (SP mode), the voltage during playback is shown in parentheses.
7. Shaded (⚠) parts are critical for safety. Replace only with specified part numbers.
8. The digital transistor is a transistor that includes built in resistors. Both PNP and NPN transistors are available.
9. Waveforms are measured with a color bar during recording (SP mode) and playback (SP mode) with alignment tape.

4.17 A/S/M (AUDIO/SERVO/MECHACON), A/CTL HEAD, CASSETTE HOUSING, END SENSOR, SUPPLY SENSOR, LOADING SENSOR, TAKE-UP SENSOR, LED, MODE CTL MOTOR, FULL ERASE HEAD AND POWER TRANSISTOR BOARDS BOARDS

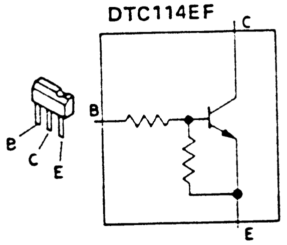
HA11780



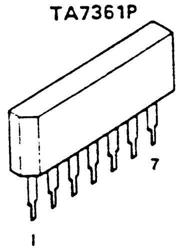
M50790SP
M50741-604SP



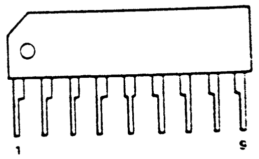
DTC144EF
DTC124EF
DTC114EF



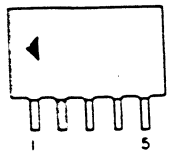
TA7361P



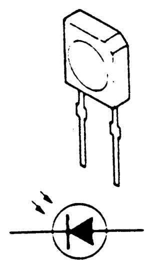
LA7225



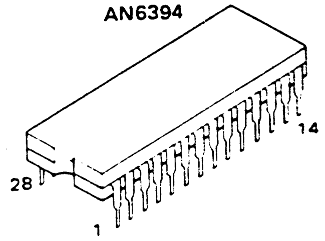
5VT01



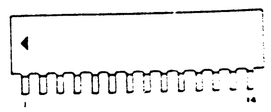
PD48PI2



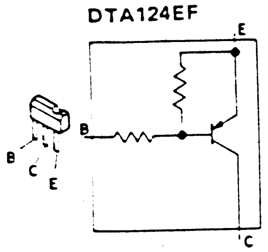
AN6394



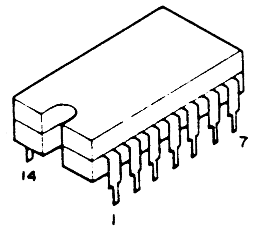
14VT07
14VT06A



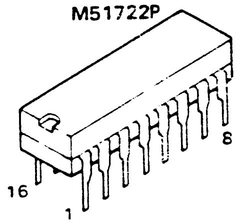
DTA124EF



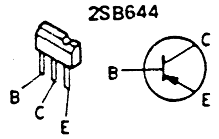
UPC339C
UPD4013BC



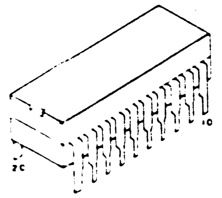
TK15050
M54519P
BA6328
BA6302A
M51722P



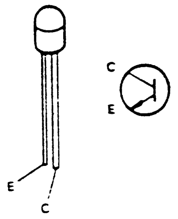
2SB822
2SB643
2SB641
2SB644



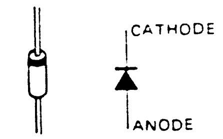
M50766-601P



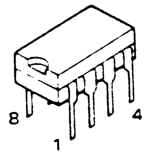
PT-352V



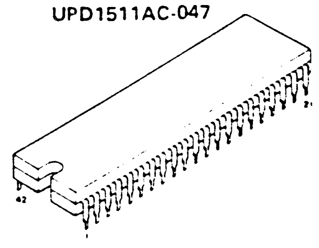
MA27WA 1SS133
MA26W 1SS132


CATHODE
ANODE

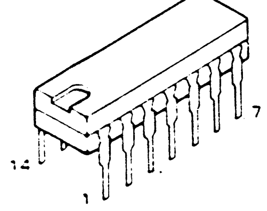
UPC358C
UPC393C
M5218P



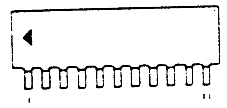
BA833S
UPD1511AC-047



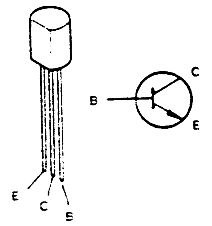
UPD4030BC
UPD4066BC



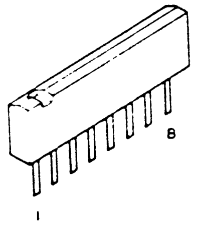
11VT01



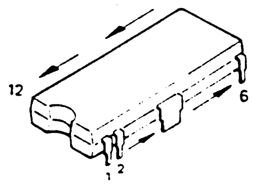
2SC458



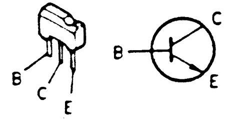
BA236
M51402L



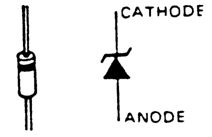
LB1649



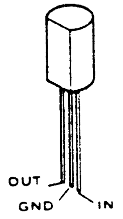
2SC2021
2SD639
2SD637
2SD636



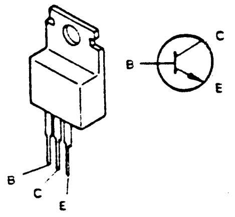
RD8.2EB2 RD8.2EB1
HZ2C3 RD6.2EB2
RD7.5EB2 RD7.5EB1
RD12EB2 RD4.7EB3
RD13EB1 RD3.0EB2
RD15EB1 RD4.3EB3


CATHODE
ANODE

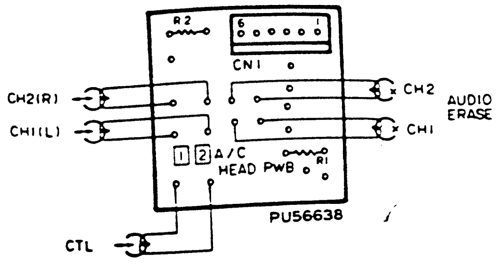
TA78L005AP



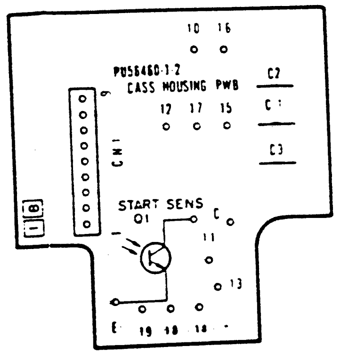
2SD880



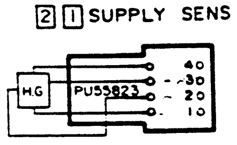
– A/CTL HEAD –


R2
6
1
CN1
CH2(R)
CH1(L)
CH2
CH1
AUDIO
ERASE
1 2 A/C
HEAD PWB
R1
PU56638
CTL

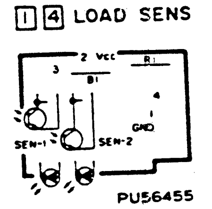
– CASSETTE HOUSING –


10 16
PU56460-1-2
CASS HOUSING PWB
C2
12 17 15
C1
CN1
C3
1 8
START SENS
Q1
C
11
13
E 19 18 14

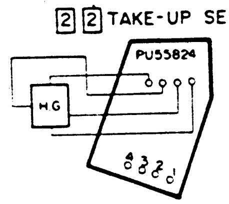
– SUPPLY SENSOR –


2 1 SUPPLY SENS
H.G
PU55823
40
30
20
10

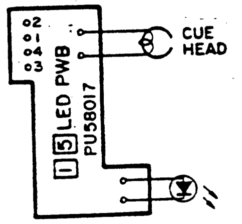
– LOADING SENSOR –


1 4 LOAD SENS
2 Vcc
R1
3
B1
4
1
GND
SEN-1
SEN-2
PU56455

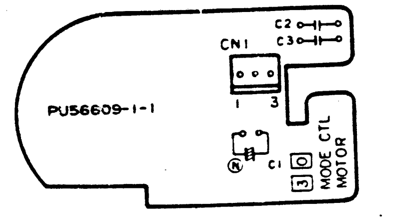
– TAKE-UP SENSOR –


2 2 TAKE-UP SENS
PU55824
H.G
4 3 2 1

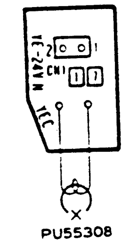
– LED –


2
1
4
3
LED PWB
PU58017
1 5
CUE
HEAD

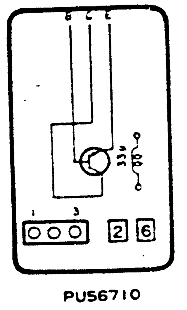
– MODE CTL MOTOR –


C2
C3
CN1
1 3
PU56609-1-1
C1
3 0
MODE CTL
MOTOR

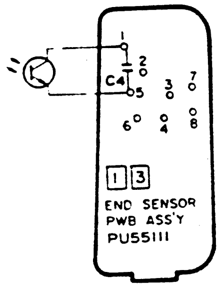
– FULL ERASE HEAD –

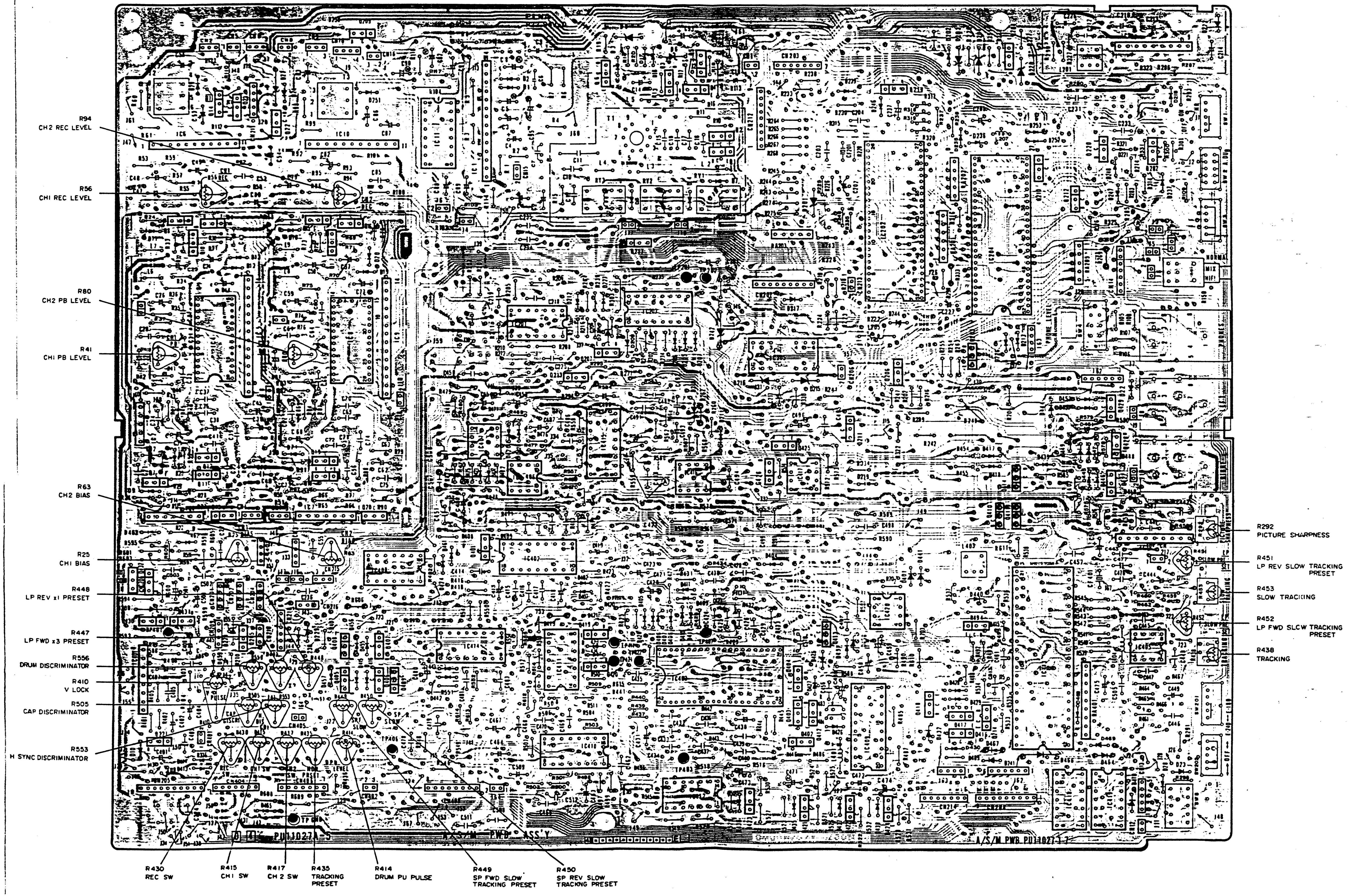

2 1
CN1
1 7
PU55308

– POWER TRANSISTOR –


B C E
1 3
2 6
PU56710

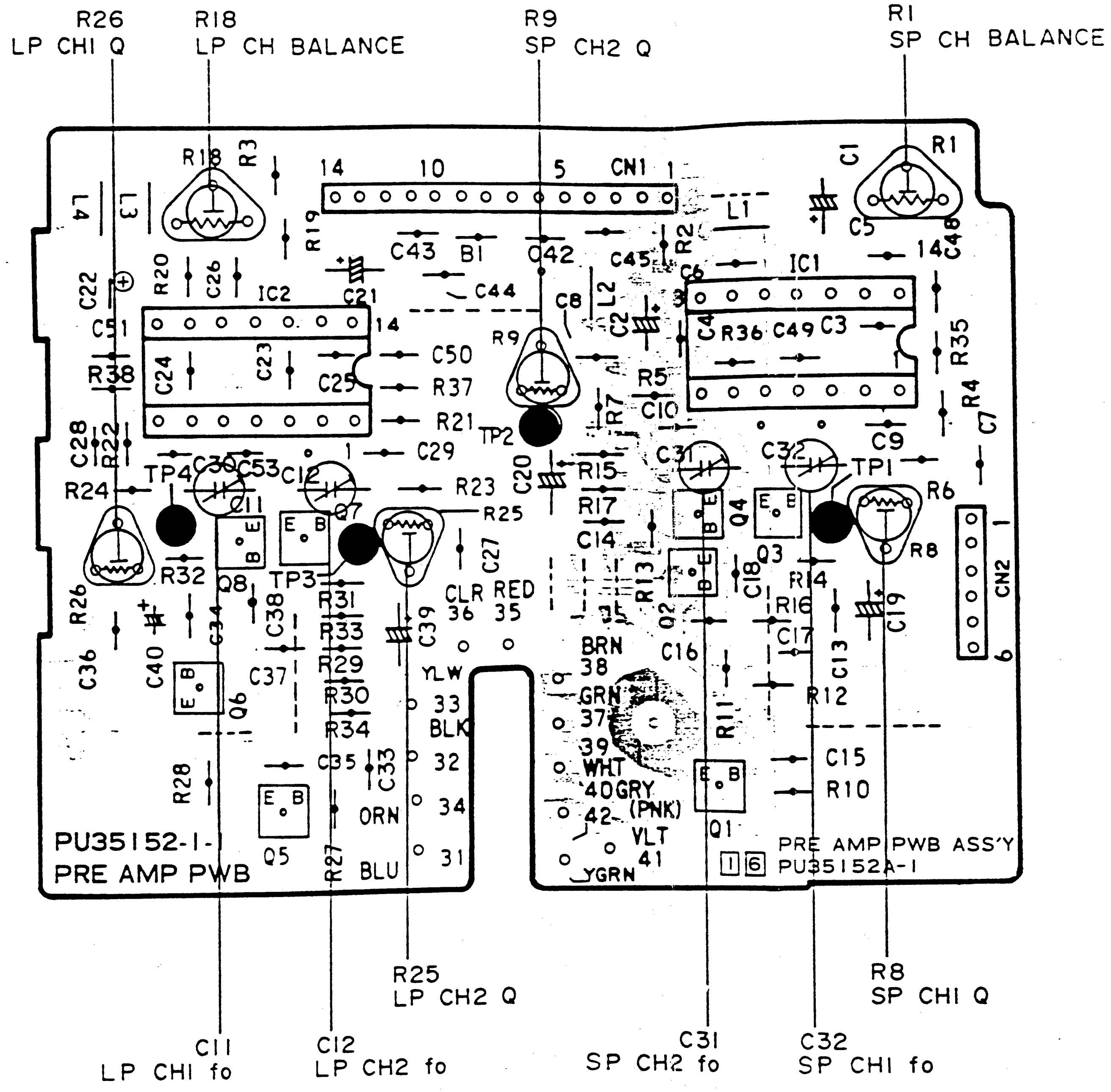
– END SENSOR –


1
2
C4
5
3
7
6
4
8
1 3
END SENSOR
PWB ASS'Y
PU55111

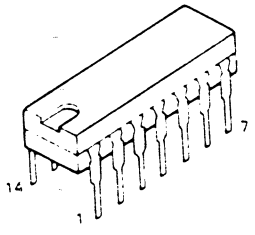

R94
CH2 REC LEVEL
R56
CH1 REC LEVEL
R80
CH2 PB LEVEL
R41
CH1 PB LEVEL
R63
CH2 BIAS
R25
CH1 BIAS
R448
LP REV x1 PRESET
R447
LP FWD x3 PRESET
R556
DRUM DISCRIMINATOR
R410
V LOCK
R505
CAP DISCRIMINATOR
R553
H SYNC DISCRIMINATOR
R430
REC SW
R415
CH1 SW
R417
CH 2 SW
R435
TRACKING PRESET
R414
DRUM PU PULSE
R449
SP FWD SLOW TRACKING PRESET
R450
SP REV SLOW TRACKNG PRESET
R292
PICTURE SHARPNESS
R451
LP REV SLOW TRACKING PRESET
R453
SLOW TRACKING
R452
LP FWD SLOW TRACKING PRESET
R438
TRACKING
A/S/M PWB ASS'Y
A/S/M PWB PU110271-1

H | I | J | K | M | N | O | P

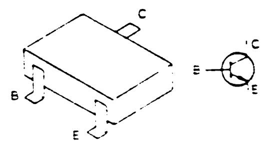
4.19 PREAMP CIRCUIT BOARD


R26
LP CH1 Q
R18
LP CH BALANCE
R9
SP CH2 Q
R1
SP CH BALANCE
PU35152-1-1
PRE AMP PWB
PRE AMP PWB ASS'Y
PU35152A-1
IC1
IC2
CN1
CN2
TP1
TP2
TP3
TP4
R25
LP CH2 Q
R8
SP CH1 Q
C11
LP CH1 fo
C12
LP CH2 fo
C31
SP CH2 fo
C32
SP CH1 fo

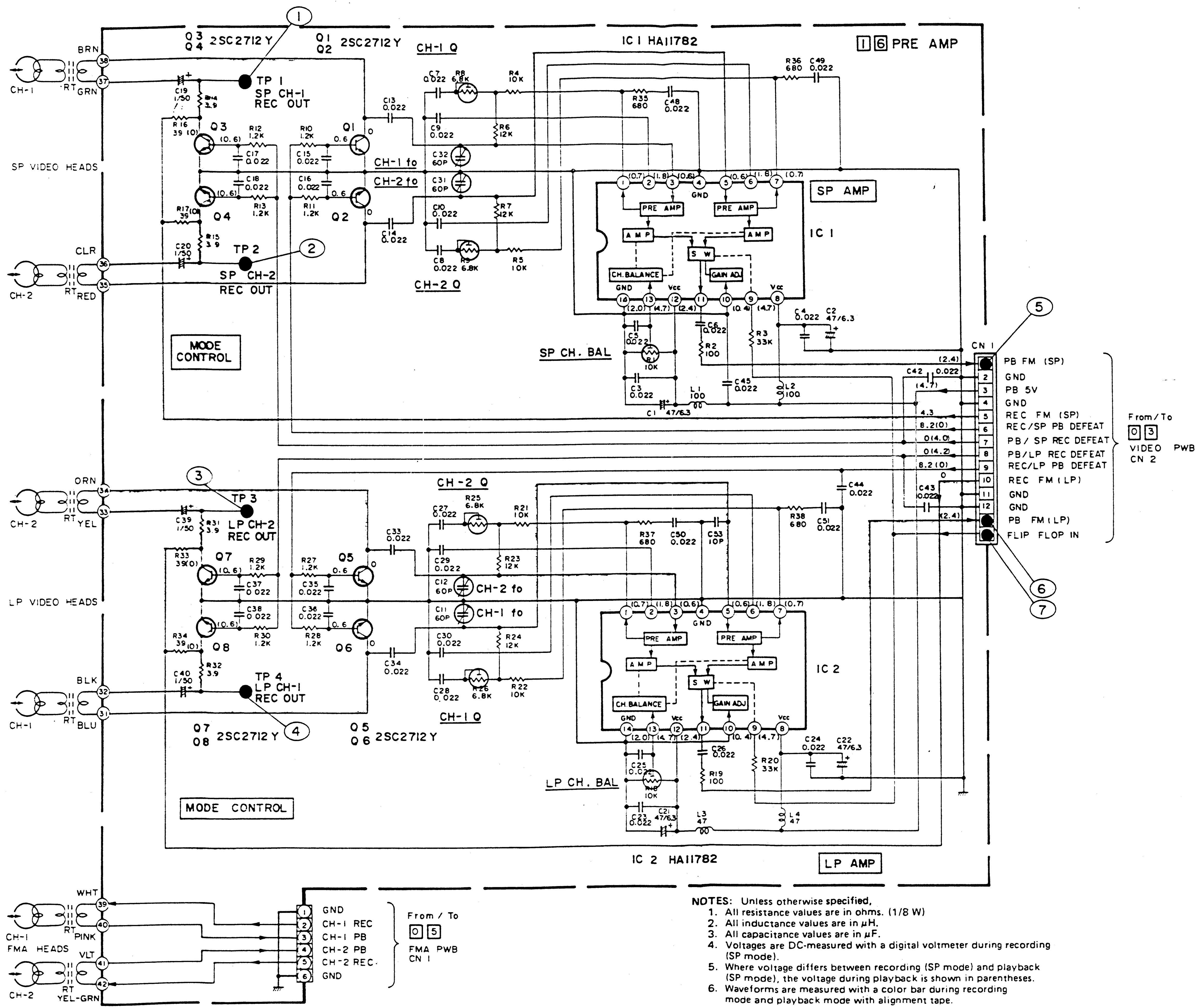
HA11782



2SC2712



4.18 PREAMP SCHEMATIC DIAGRAM

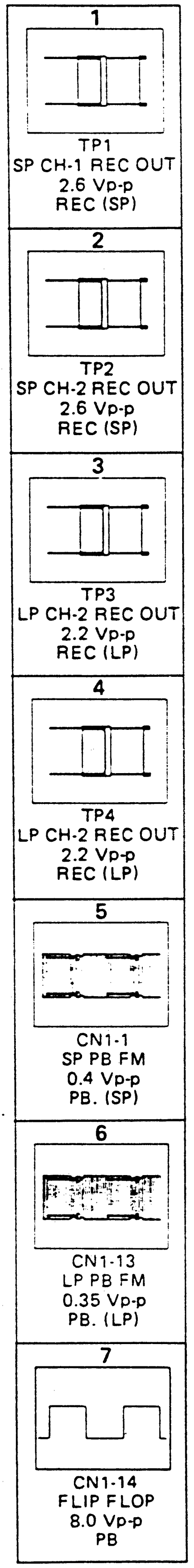


1 6 PRE AMP
Q3 Q4 2SC2712Y
Q1 Q2 2SC2712Y
IC 1 HA11782
CH-1 Q
CH-2 Q
CH-1 fo
CH-2 fo
TP 1 SP CH-1 REC OUT
TP 2 SP CH-2 REC OUT
TP 3 LP CH-2 REC OUT
TP 4 LP CH-1 REC OUT
SP VIDEO HEADS
LP VIDEO HEADS
CH-1 FMA HEADS
CH-1
CH-2
BRN
GRN
CLR
RED
ORN
YEL
BLK
BLU
WHT
PINK
VLT
YEL-GRN
RT
MODE CONTROL
SP AMP
IC 1
PRE AMP
AMP
SW
CH. BALANCE
GAIN ADJ.
GND
Vcc
SP CH. BAL
LP CH. BAL
IC 2
IC 2 HA11782
LP AMP
Q7 Q8 2SC2712Y
Q5 Q6 2SC2712Y
CN 1
1 PB FM (SP)
2 GND
3 PB 5V
4 GND
5 REC FM (SP)
6 REC/SP PB DEFEAT
7 PB/ SP REC DEFEAT
8 PB/LP REC DEFEAT
9 REC/LP PB DEFEAT
10 REC FM (LP)
11 GND
12 GND
13 PB FM (LP)
14 FLIP FLOP IN
From / To
0 3 VIDEO PWB CN 2
1 GND
2 CH-1 REC
3 CH-1 PB
4 CH-2 PB
5 CH-2 REC.
6 GND
From / To
0 5 FMA PWB CN 1

NOTES: Unless otherwise specified,

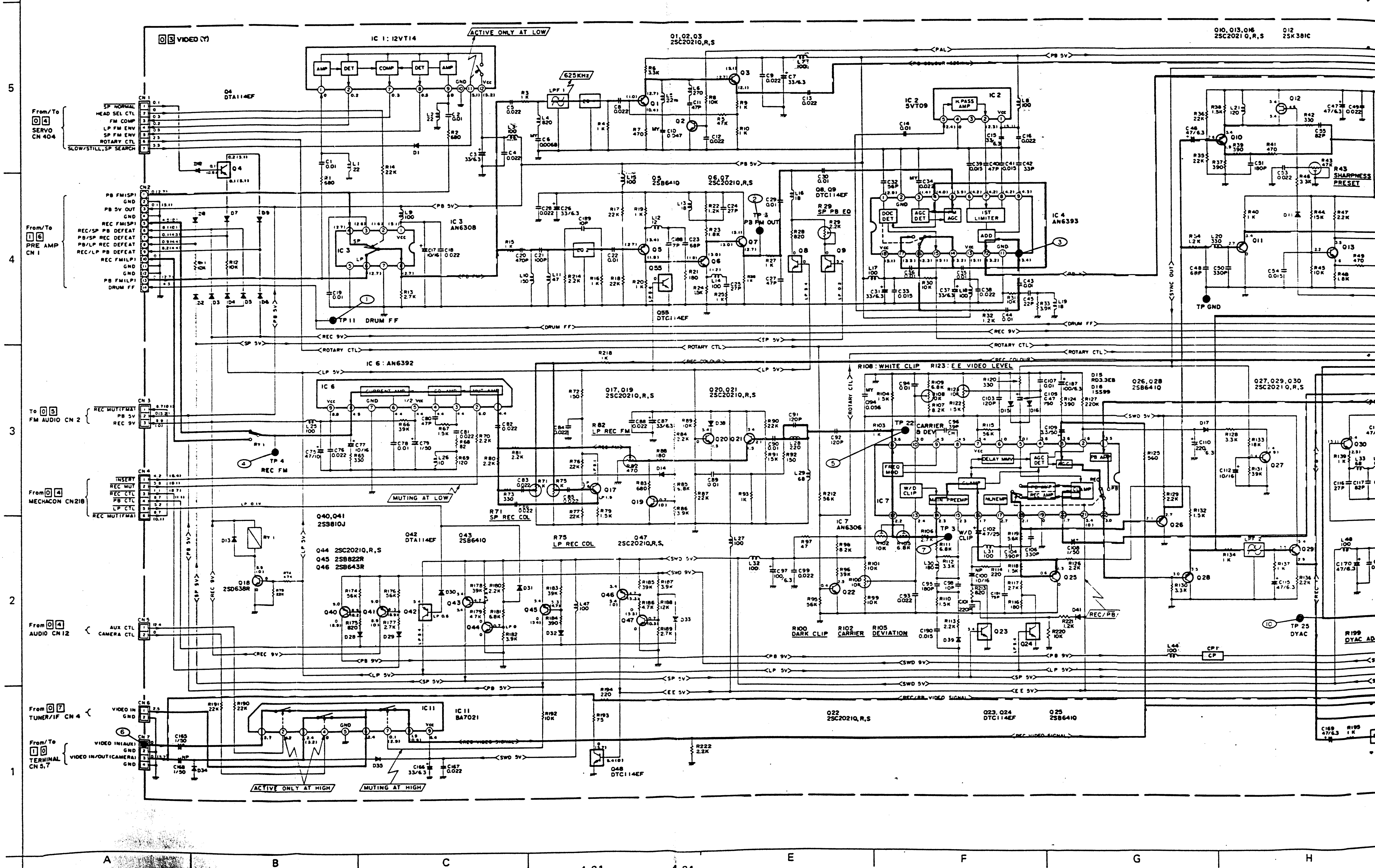
1. All resistance values are in ohms. (1/8 W)
2. All inductance values are in μH.
3. All capacitance values are in μF.
4. Voltages are DC-measured with a digital voltmeter during recording (SP mode).
5. Where voltage differs between recording (SP mode) and playback (SP mode), the voltage during playback is shown in parentheses.
6. Waveforms are measured with a color bar during recording mode and playback mode with alignment tape.

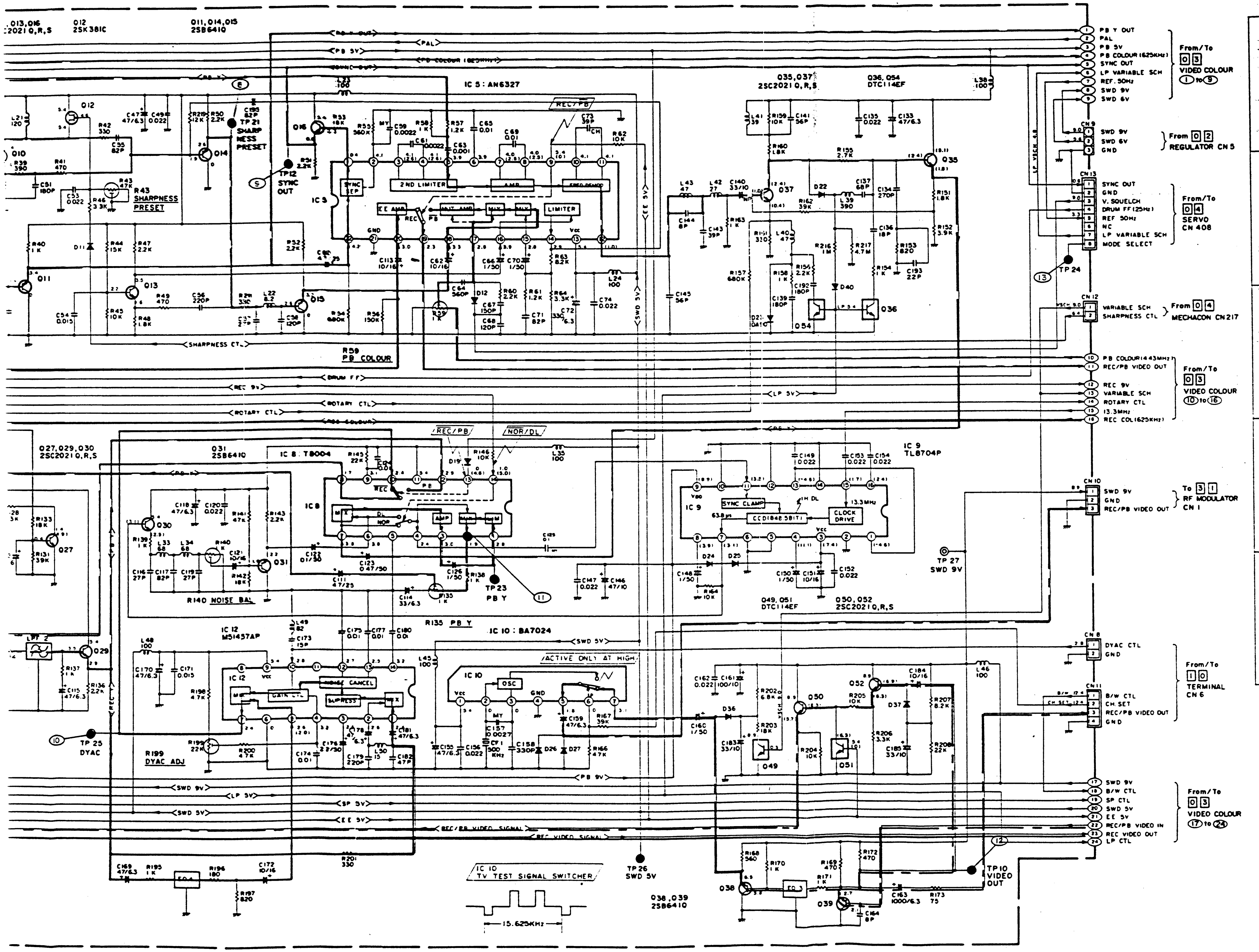
Waveforms of preamp circuit



4.20 VIDEO SCHEMATIC DIAGRAM

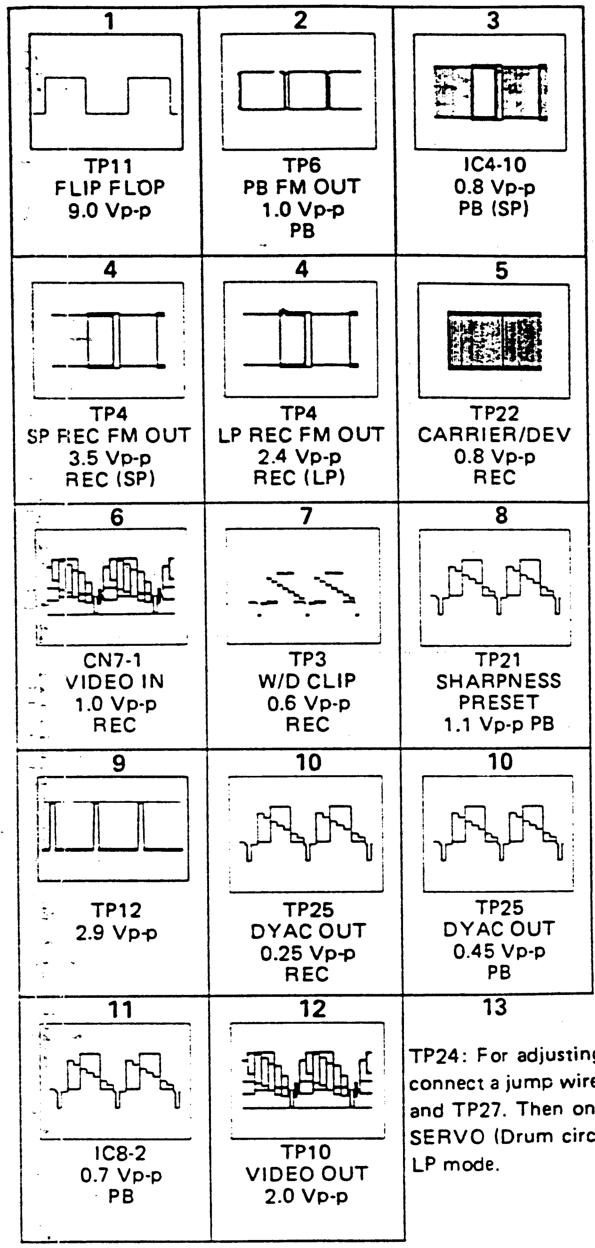
4.20.1 Luminance


03 VIDEO (Y)
IC 1 : 12VT14
ACTIVE ONLY AT LOW
AMP
DET
COMP
GND
Vcc
625KHz
LPF 1
Q1,Q2,Q3
2SC2021Q,R,S
Q10,Q13,Q16
2SC2021Q,R,S
Q12
2SK381C
From/To 04 SERVO CN 404
SP NORMAL
HEAD SEL CTL
FM COMP
LP FM ENV
SP FM ENV
ROTARY CTL
SLOW/STILL,SP SEARCH
Q4 DTA114EF
IC 2 5VT09
H.PASS AMP
R43 SHARPNESS PRESET
From/To 16 PRE AMP CN 1
PB FM(SP)
PB 5V OUT
REC FM(SP)
REC/SP PB DEFEAT
PB/SP REC DEFEAT
PB/LP REC DEFEAT
REC/LP PB DEFEAT
REC FM(LP)
PB FM(LP)
DRUM FF
IC 3 AN6308
Q5 2SB641Q
Q6,Q7 2SC2021Q,R,S
Q8,Q9 DTC114EF
R 29 SP PB EQ
TP 5 PB FM OUT
IC 4 AN6393
DOC DET
AGC DET
AGC
1ST LIMITER
ADD
TP GND
TP 11 DRUM FF
Q55 DTC114EF
DRUM FF
REC 9V
SP 5V
ROTARY CTL
PB 5V
LP 5V
IC 6 : AN6392
CURRENT AMP
CO AMP
MUT AMP
R108 : WHITE CLIP
R123 : E E VIDEO LEVEL
To 05 FM AUDIO CN 2
REC MUT(FM)
PB 5V
REC 9V
TP 4 REC FM
Q17,Q19 2SC2021Q,R,S
Q20,Q21 2SC2021Q,R,S
R 82 LP REC FM
D15 RD3.3EB
D16 1SS99
Q26,Q28 2SB641Q
Q27,Q29,Q30 2SC2021Q,R,S
TP 22 CARRIER & DEV
FREQ MOD
W/D CLIP
MAIN PREEMP
NLNEMP
DELAY MMV
AGC DET
CLAMP
REC AMP
PB AMP
IC 7
IC 7 AN6306
TP 3 W/D CLIP
From 04 MECHACON CN218
INSERT
REC MUT
REC CTL
PB CTL
LP CTL
REC MUT(FMA)
MUTING AT LOW
R71 SP REC COL
R75 LP REC COL
Q40,Q41 2SB810J
Q42 DTA114EF
Q43 2SB641Q
Q44 2SC2021Q,R,S
Q45 2SB822R
Q46 2SB643R
Q47 2SC2021Q,R,S
Q18 2SD638R
RY 1
R100 DARK CLIP
R102 CARRIER
R105 DEVIATION
REC/PB
LPF 2
TP 25 DYAC
R199 DYAC AD
From 04 AUDIO CN 12
AUX CTL
CAMERA CTL
SWD 5V
SWD 9V
EE 5V
REC/PB VIDEO SIGNAL
REC VIDEO SIGNAL
From 07 TUNER/IF CN 4
VIDEO IN
GND
From/To 10 TERMINAL CN 5,7
VIDEO IN(AUX)
VIDEO IN/OUT(CAMERA)
IC 11 BA7021
ACTIVE ONLY AT HIGH
MUTING AT HIGH
Q22 2SC2021Q,R,S
Q23,Q24 DTC114EF
Q25 2SB641Q
Q48 DTC114EF
SYNC OUT
A
B
C
D
E
F
G
H
1
2
3
4
5
6


IC 5 : AN6327
IC 8 : TB004
IC 9 TL8704P
IC 10 : BA7024
IC 12 M51457AP
Q11,Q14,Q15 2SB641Q
Q12 2SK381C
Q35,Q37 2SC2021Q,R,S
Q36,Q54 DTC114EF
Q27,Q29,Q30 2SC2021Q,R,S
Q31 2SB641Q
Q49,Q51 DTC114EF
Q50,Q52 2SC2021Q,R,S
Q38,Q39 2SB641Q
2ND LIMITER
SYNC SEP
EE AMP
LIMITER
SYNC CLAMP
CCD(1848.5BIT)
CLOCK DRIVE
NOISE CANCEL
OSC
R43 SHARPNESS PRESET
TP21 SHARPNESS PRESET
TP12 SYNC OUT
R59 PB COLOUR
R140 NOISE BAL
R135 PB Y
TP23 PB Y
R199 DYAC ADJ
TP25 DYAC
TP26 SWD 5V
TP27 SWD 9V
TP24
TP10 VIDEO OUT
REC/PB
NOR/DL
ACTIVE ONLY AT HIGH
IC 10 TV TEST SIGNAL SWITCHER
15.625KHz
PB Y OUT
PAL
PB 5V
PB COLOUR (625kHz)
SYNC OUT
LP VARIABLE SCH
REF. 50Hz
SWD 9V
SWD 6V
From/To 03 VIDEO COLOUR ① to ⑨
SWD 9V
SWD 6V
GND
From 02 REGULATOR CN5
SYNC OUT
GND
V. SQUELCH
DRUM FF (25Hz)
REF 50Hz
NC
LP VARIABLE SCH
MODE SELECT
From/To 04 SERVO CN 408
VARIABLE SCH
SHARPNESS CTL
From 04 MECHACON CN217
PB COLOUR (4.43MHz)
REC/PB VIDEO OUT
REC 9V
VARIABLE SCH
ROTARY CTL
13.3MHz
REC COL (625kHz)
From/To 03 VIDEO COLOUR ⑩ to ⑯
SWD 9V
GND
REC/PB VIDEO OUT
To 31 RF MODULATOR CN1
DYAC CTL
GND
B/W CTL
CH SET
REC/PB VIDEO OUT
GND
From/To 10 TERMINAL CN6
SWD 9V
B/W CTL
SP CTL
SWD 5V
EE 5V
REC/PB VIDEO IN
REC VIDEO OUT
LP CTL
From/To 03 VIDEO COLOUR ⑰ to ㉔
H
I
J
K
M
N
O

Waveforms of video circuit

– Luminance –

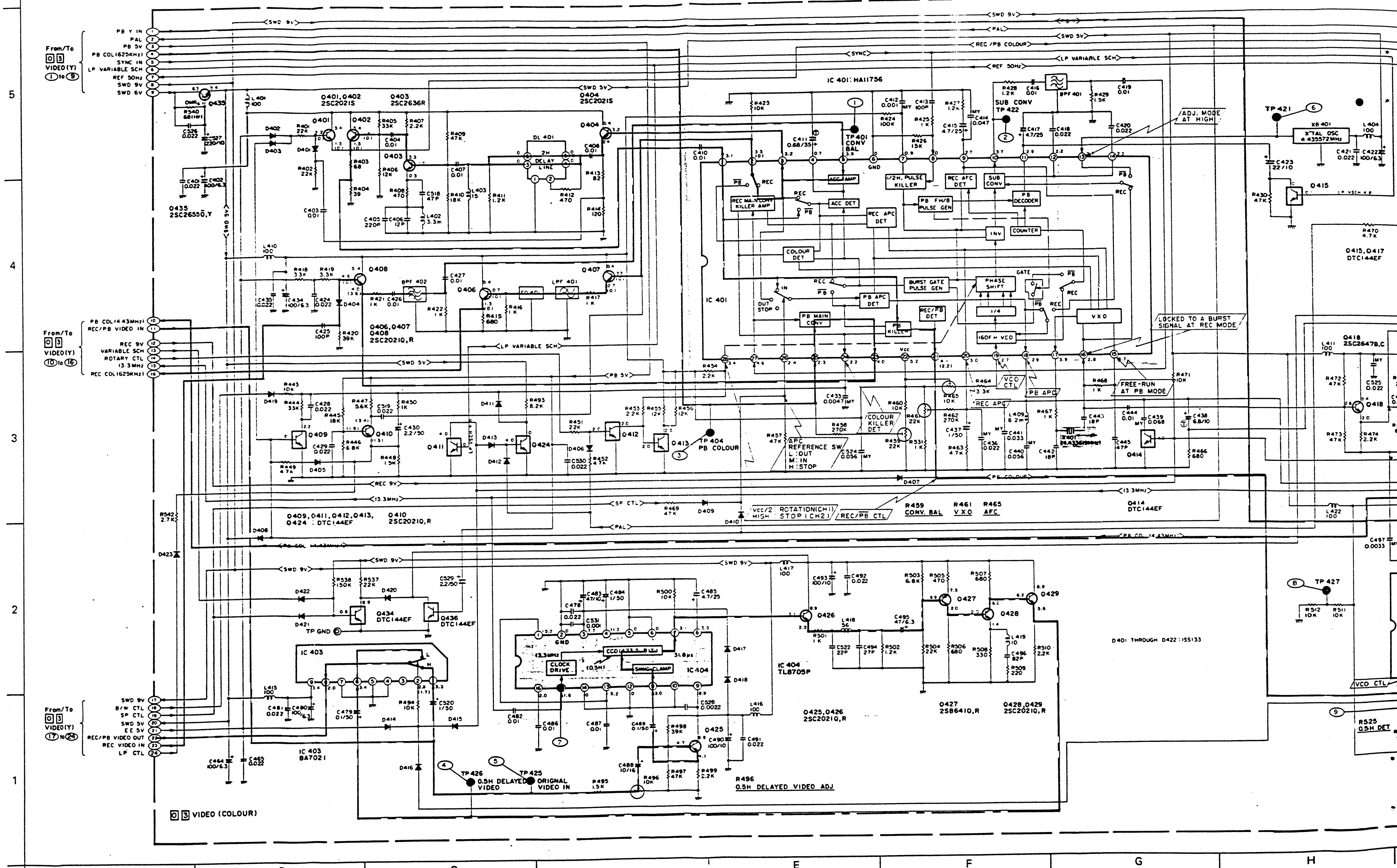


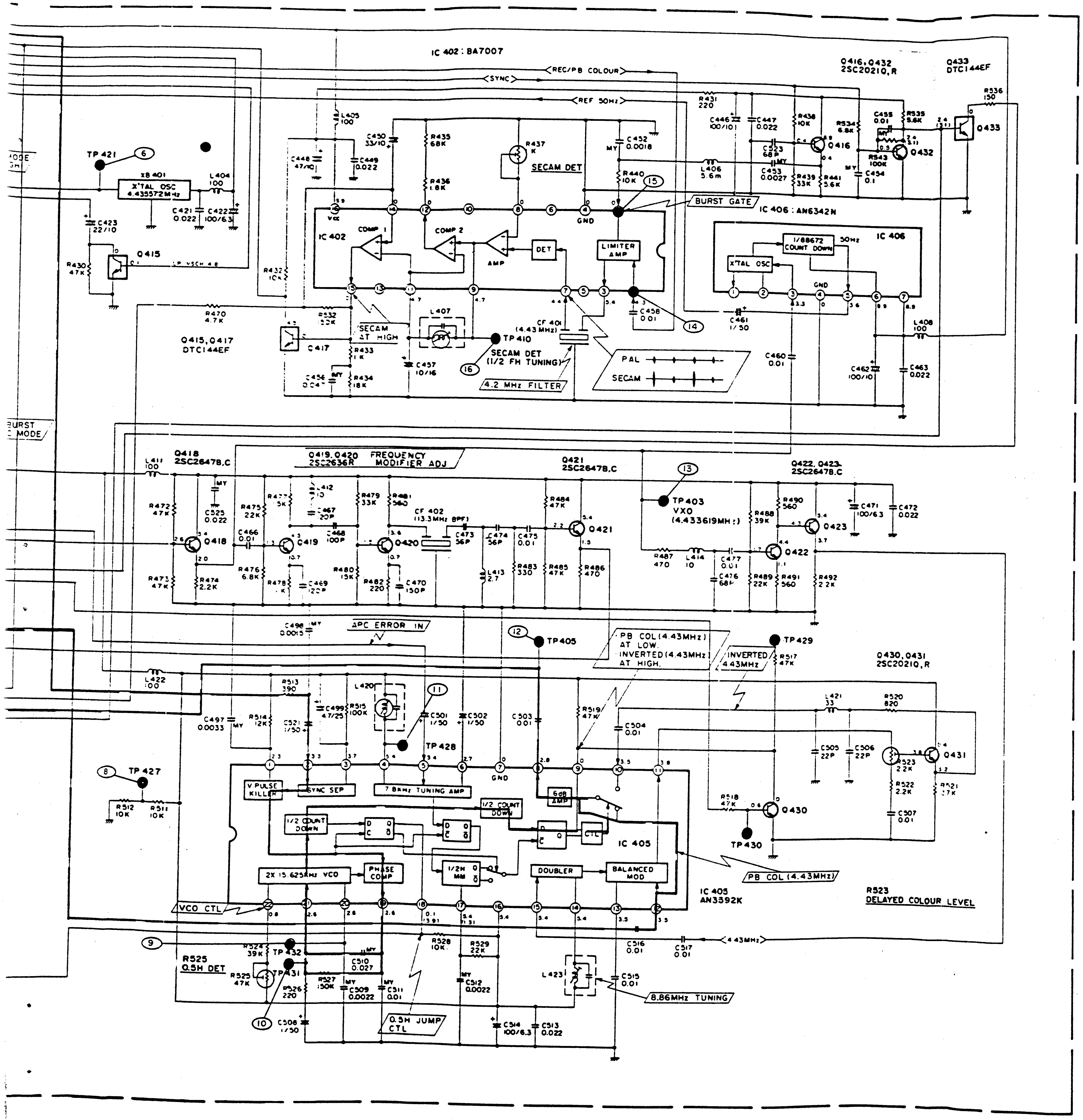
TP24: For adjusting video circuit, connect a jump wire between TP24 and TP27. Then only VIDEO and SERVO (Drum circuit) operate as LP mode.

NOTES: Unless otherwise specified,

1. All resistance values are in ohms. (1/6 W, 1/8 W)
2. All inductance values are in μH.
3. All capacitance values are in μF.
4. All diodes are 1SS133.
5. Voltages are DC-measured with a digital voltmeter during recording (SP mode).
6. Where voltage differs between recording (SP mode) and playback (SP mode), the voltage during playback is shown in parentheses.
7. The digital transistor is a transistor that includes built in resistors. Both PNP and NPN transistors are available.
8. Waveforms are measured with a color bar during recording (SP mode) and playback (SP mode) with alignment tape.
9. Shaded ( ) parts are critical for safety. Replace only with specified part numbers.

4.20.2 Colour

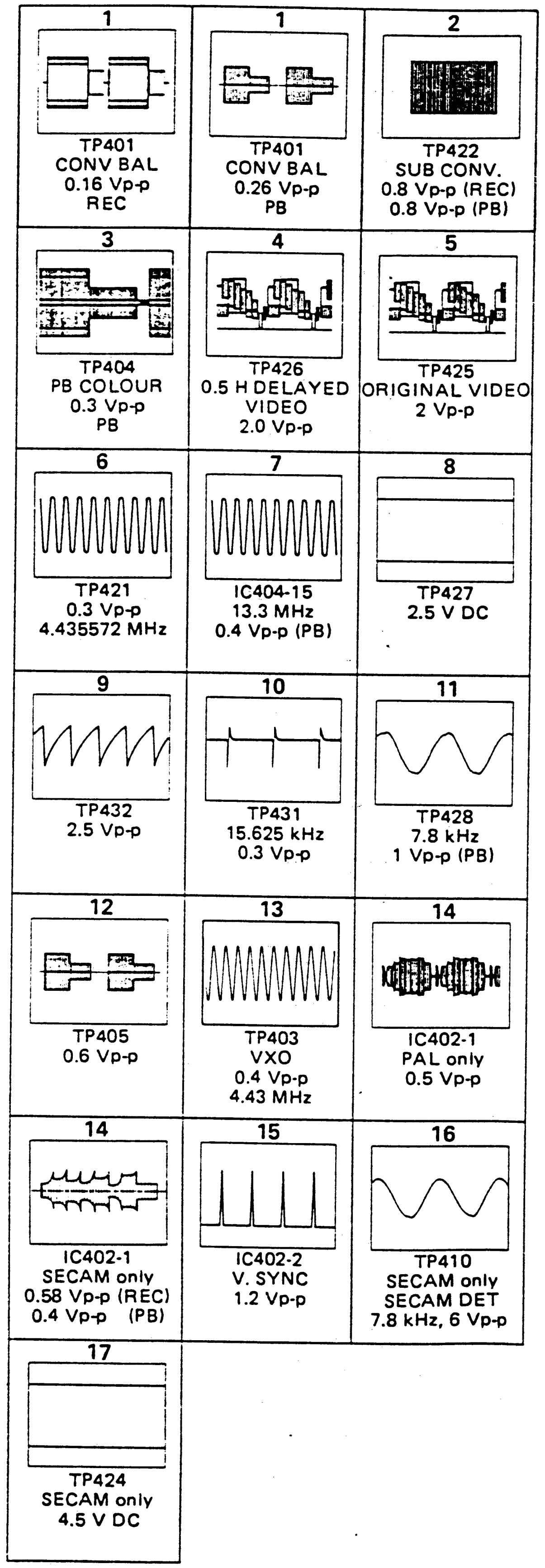

From/To
03 VIDEO (Y) ① to ⑨
PB Y IN
PAL
PB 5V
PB COL(625KHz)
SYNC IN
LP VARIABLE SCH
REF 50Hz
SWD 9V
SWD 6V
From/To
03 VIDEO (Y) ⑩ to ⑯
PB COL(4.43MHz)
REC/PB VIDEO IN
REC 9V
VARIABLE SCH
ROTARY CTL
13.3MHz
REC COL(625KHz)
From/To
03 VIDEO (Y) ⑰ to ㉔
SWD 9V
B/W CTL
SP CTL
SWD 5V
EE 5V
REC/PB VIDEO OUT
REC VIDEO IN
LP CTL
IC 401: HA11756
Q401,Q402 2SC2021S
Q403 2SC2636R
Q404 2SC2021S
Q435 2SC2655O,Y
DL 401 2H DELAY LINE
BPF 402
LPF 401
Q406,Q407,Q408 2SC2021Q,R
TP401 CONV BAL
SUB CONV TP 422
TP 421
X'TAL OSC 4.433572MHz
XB401
Q415
Q415,Q417 DTC144EF
REC MAIN CONV KILLER AMP
ACC AMP
ACC DET
REC APC DET
1/2H PULSE KILLER
PB FH/B PULSE GEN
REC AFC DET
SUB CONV
PB DECODER
INV
COUNTER
COLOUR DET
BURST GATE PULSE GEN
PHASE SHIFT
PB APC DET
PB MAIN CONV
PB KILLER
REC/PB DET
1/4
160FH VCO
VXO
GATE
ADJ. MODE AT HIGH
LOCKED TO A BURST SIGNAL AT REC MODE
FREE-RUN AT PB MODE
VCO CTL
PB APC
REC APC
COLOUR KILLER DET
APC REFERENCE SW
L : OUT
M : IN
H : STOP
TP 404 PB COLOUR
Vcc/2 ROTATION(CH1)
HIGH STOP (CH2)
REC/PB CTL
R459 CONV. BAL
R461 VXO
R465 AFC
Q414 DTC144EF
Q418 2SC2647B,C
Q409,Q411,Q412,Q413, Q424 : DTC144EF
Q410 2SC2021Q,R
Q434 DTC144EF
Q436 DTC144EF
TP GND
IC 403 BA7021
IC 404 TL8705P
CLOCK DRIVE
CCD
SYNC CLAMP
Q425,Q426 2SC2021Q,R
Q427 2SB641Q,R
Q428,Q429 2SC2021Q,R
TP 426 0.5H DELAYED VIDEO
TP 425 ORIGNAL VIDEO IN
R496 0.5H DELAYED VIDEO ADJ
D401 THROUGH D422 : 1SS133
TP 427
R525 0.5H DET
03 VIDEO (COLOUR)


IC 402 : BA7007
REC/PB COLOUR
SYNC
REF 50Hz
Q416, Q432 2SC2021Q, R
Q433 DTC144EF
TP 421
X'TAL OSC 4.435572MHz
Q415
SECAM DET
BURST GATE
IC 406 : AN6342N
IC 402
COMP 1
COMP 2
DET
LIMITER AMP
AMP
GND
1/88672 COUNT DOWN
X'TAL OSC
IC 406
Q415, Q417 DTC144EF
SECAM AT HIGH
TP 410
SECAM DET (1/2 FH TUNING)
4.2 MHz FILTER
CF 401 (4.43 MHz)
PAL
SECAM
BURST MODE
Q418 2SC2647B,C
Q419, Q420 2SC2636R
FREQUENCY MODIFIER ADJ
Q421 2SC2647B,C
Q422, Q423 2SC2647B,C
TP 403 VXO (4.433619MHz)
CF 402 (13.3MHz BPF)
APC ERROR IN
TP 405
TP 429
PB COL (4.43MHz) AT LOW. INVERTED (4.43MHz) AT HIGH.
INVERTED 4.43MHz
Q430, Q431 2SC2021Q, R
TP 427
TP 428
V PULSE KILLER
SYNC SEP
7.8kHz TUNING AMP
1/2 COUNT DOWN
6dB AMP
CTL
IC 405
2X 15.625kHz VCO
PHASE COMP
1/2H MM
DOUBLER
BALANCED MOD
IC 405 AN3592K
PB COL (4.43MHz)
R523 DELAYED COLOUR LEVEL
TP 430
VCO CTL
4.43MHz
R525 0.5H DET
TP 432
TP 431
0.5H JUMP CTL
8.86MHz TUNING
L423

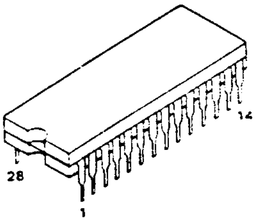
NOTES: Unless otherwise specified,

1. All resistance values are in ohms. (1/6 W, 1/8 W)
2. All inductance values are in μH.
3. All capacitance values are in μF.
4. All diodes are 1SS133.
5. Voltages are DC-measured with a digital voltmeter during recording (SP mode).
6. Where voltage differs between recording (SP mode) and playback (SP mode), the voltage during playback is shown in parentheses.
7. The digital transistor is a transistor that includes built in resistors. Both PNP and NPN transistors are available.
8. Waveforms are measured with a color bar during recording (SP mode) and playback (SP mode) with alignment tape.
9. Shaded ( ) parts are critical for safety. Replace only with specified part numbers.

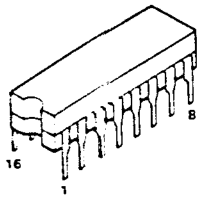
Waveforms of video circuit
– Colour –



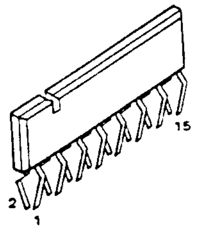
HA11756



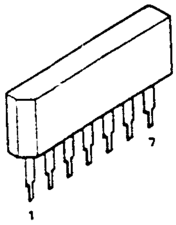
TL8704P
TL8705P



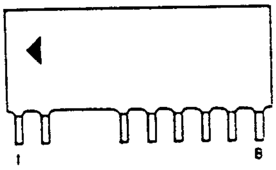
BA7007



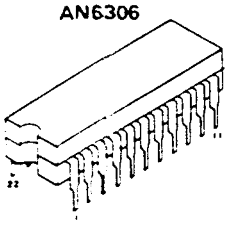
AN6342N



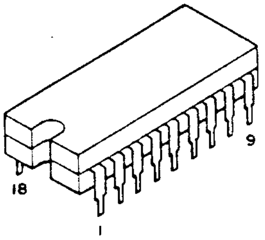
12VT14



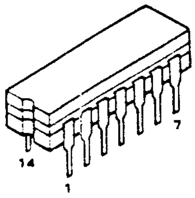
AN3592K
AN6327
AN6306



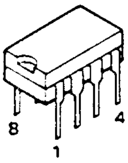
AN6393



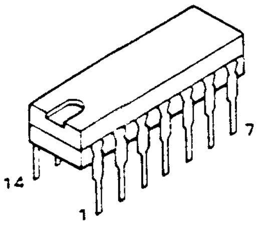
T8004



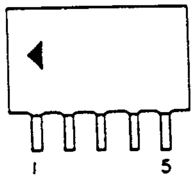
AN6308



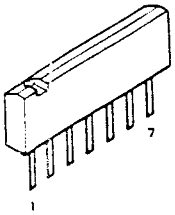
M51457AP



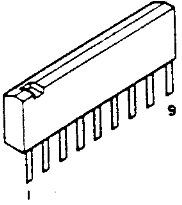
5VT09



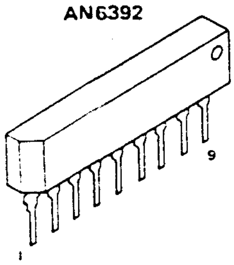
BA7024



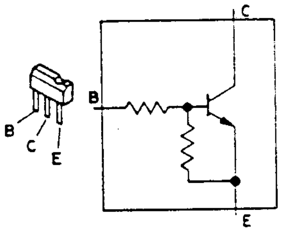
BA7021



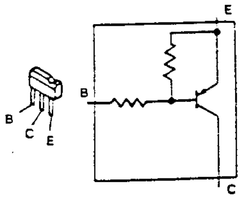
AN6392



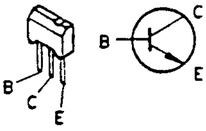
DTC144EF
DTC144W
DTC124EF



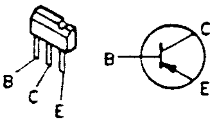
DTA114F



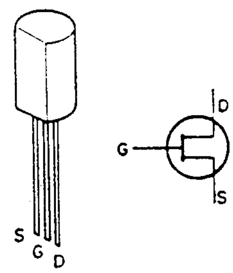
2SC2647
2SC2636
2SD638
2SC2021



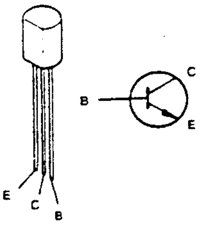
2SB822
2SB643
2SB641



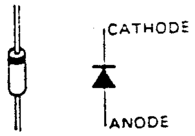
2SK381C



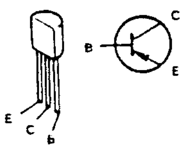
2SC2655



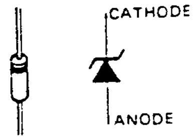
OA90
1SS99
1SS133


CATHODE
ANODE

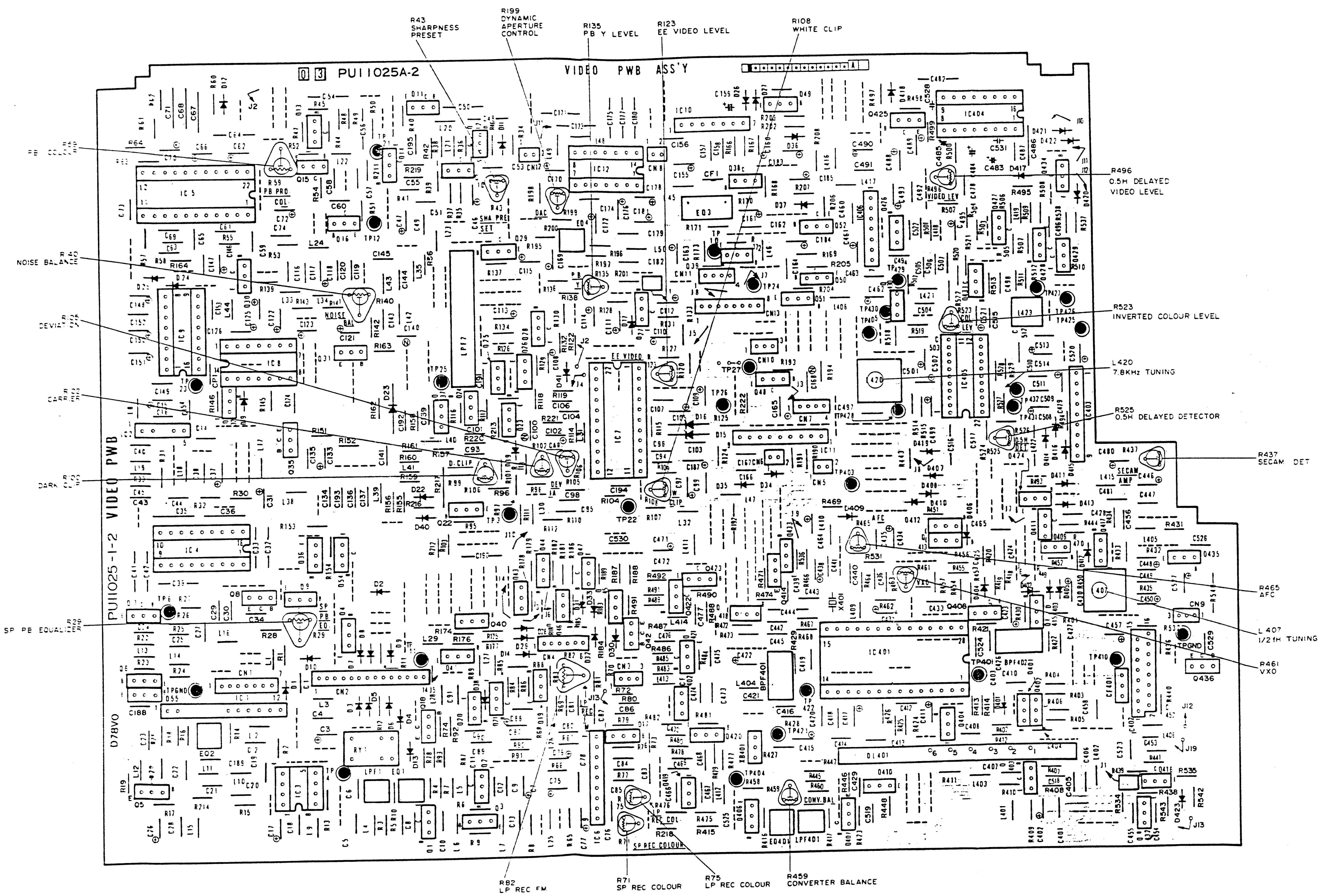
2SB810



RD3.3EB

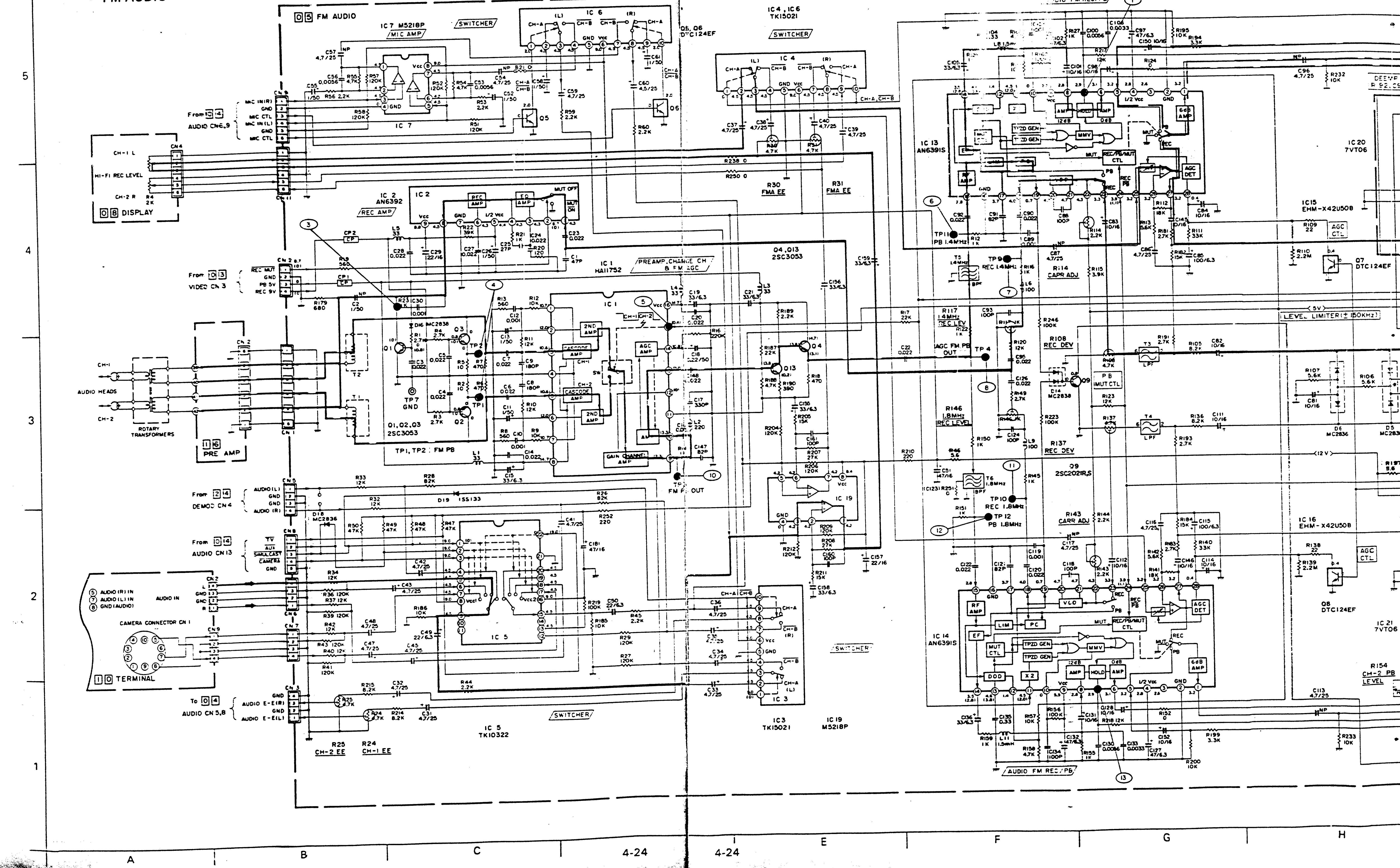

CATHODE
ANODE

4.21 VIDEO CIRCUIT BOARD


R43 SHARPNESS PRESET
R199 DYNAMIC APERTURE CONTROL
R135 PB Y LEVEL
R123 EE VIDEO LEVEL
R108 WHITE CLIP
R59 PB COLOUR
R140 NOISE BALANCE
R125 DEVIATION
R102 CARRIER
R106 DARK CLIP
R29 SP PB EQUALIZER
R496 0.5H DELAYED VIDEO LEVEL
R523 INVERTED COLOUR LEVEL
L420 7.8KHz TUNING
R525 0.5H DELAYED DETECTOR
R437 SECAM DET
R465 AFC
L407 1/2fH TUNING
R461 VXO
R82 LP REC FM
R71 SP REC COLOUR
R75 LP REC COLOUR
R459 CONVERTER BALANCE
03 PU11025A-2
VIDEO PWB ASS'Y
PU11025-1-2 VIDEO PWB
D78VO
6
5
4
3
2
1
A
B
C
D
E
F
G
H

4.22 FM AUDIO AND AUDIO INDICATOR SCHEMATIC DIAGRAMS

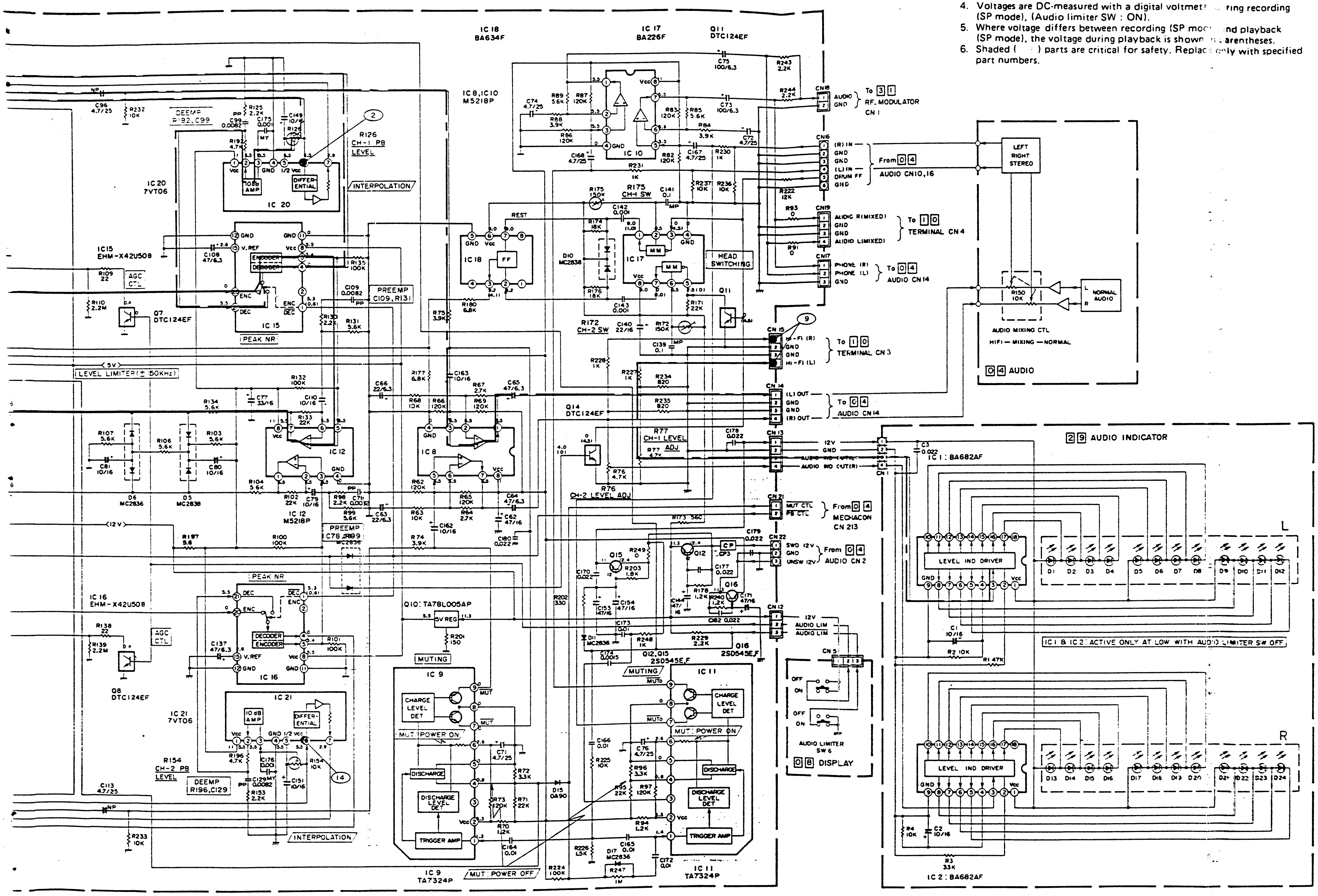
– FM AUDIO –


05 FM AUDIO
IC 7 M5218P
MIC AMP
SWITCHER
IC 6
Q5, Q6 DTC124EF
IC4, IC6 TK15021
IC 4
IC10 FM REC/PB
From 04 AUDIO CN6,9
MIC IN (R)
GND
MIC CTL
MIC IN (L)
GND
MIC CTL
CN 4
CH-1 L
HI-FI REC LEVEL
CH-2 R
08 DISPLAY
IC 2 AN6392
REC AMP
MUT OFF
R30 FMA EE
R31 FMA EE
IC 13 AN6391S
IC 20 7VT06
IC15 EHM-X42U508
AGC CTL
Q7 DTC124EF
From 03 VIDEO CN 3
REC MUT
PB 5V
REC 9V
IC 1 HA11752
PREAMP, CHANGE CH & FM AGC
Q4, Q13 2SC3053
TP11 PB 1.4MHz
TP 9 REC 1.4MHz
R114 CAPR ADJ
LEVEL LIMITER (± 150kHz)
AUDIO HEADS
CH-1
CH-2
ROTARY TRANSFORMERS
16 PRE AMP
Q1, Q2, Q3 2SC3053
TP7 GND
TP1, TP2 : FM PB
CASCODE AMP
2ND AMP
AGC AMP
GAIN CHANNEL AMP
R117 1.4MHz REC LEV
AGC FM PB OUT
TP 4
R108 REC DEV
PB MUT CTL
Q9 2SC2021R,S
R146 1.8MHz REC LEVEL
R137 REC DEV
TP FM PB OUT
T6 1.8MHz
TP10 REC 1.8MHz
TP 12 PB 1.8MHz
R143 CARR ADJ
IC 19
IC 16 EHM-X42U508
Q8 DTC124EF
IC 21 7VT06
From 24 DEMOD CN 4
AUDIO (L)
GND
AUDIO (R)
D19 1SS133
D18 MC2836
From 04 AUDIO CN 13
TV
AUX
SIMULCAST
CAMERA
GND
AUDIO (R) IN
AUDIO (L) IN
GND (AUDIO)
AUDIO IN
CAMERA CONNECTOR CN 1
10 TERMINAL
IC 5
IC 3
IC 14 AN6391S
R154 CH-2 PB LEVEL
To 04 AUDIO CN 5,8
AUDIO E-E (R)
AUDIO E-E (L)
R25 CH-2 EE
R24 CH-1 EE
SWITCHER
IC 5 TK10322
IC3 TK15021
IC19 M5218P
AUDIO FM REC/PB
A
B
C
D
E
F
G
H
1
2
3
4
5
6

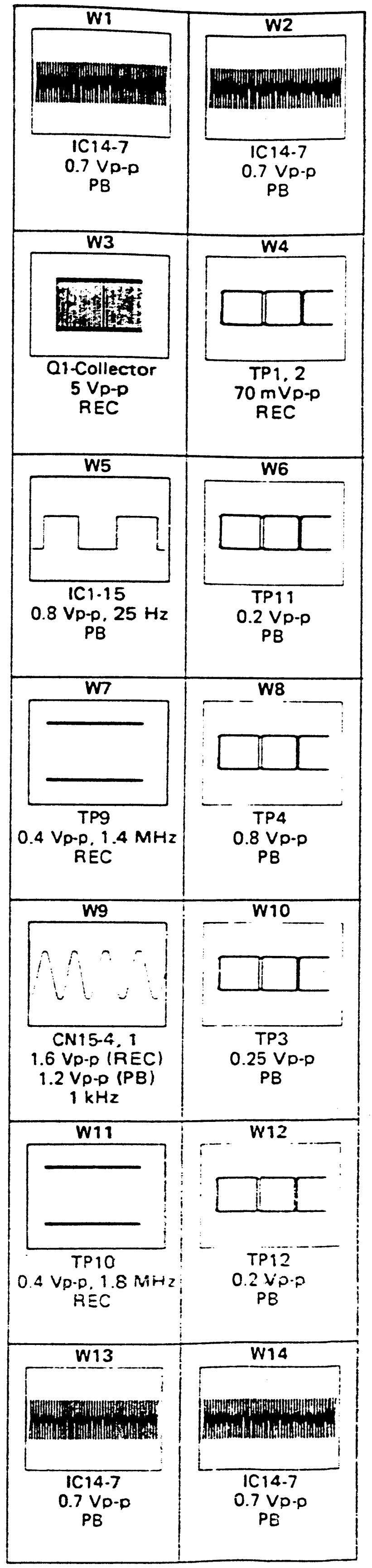
FM AUDIO FM AUDIO

NOTES: Unless otherwise specified.

1. All resistance values are in ohms. (1/6 W, 1/8 W)
2. All inductance values are in μH.
3. All capacitance values are in μF.
4. Voltages are DC-measured with a digital voltmeter during recording (SP mode), (Audio limiter SW : ON).
5. Where voltage differs between recording (SP mode) and playback (SP mode), the voltage during playback is shown in parentheses.
6. Shaded ( ) parts are critical for safety. Replace only with specified part numbers.

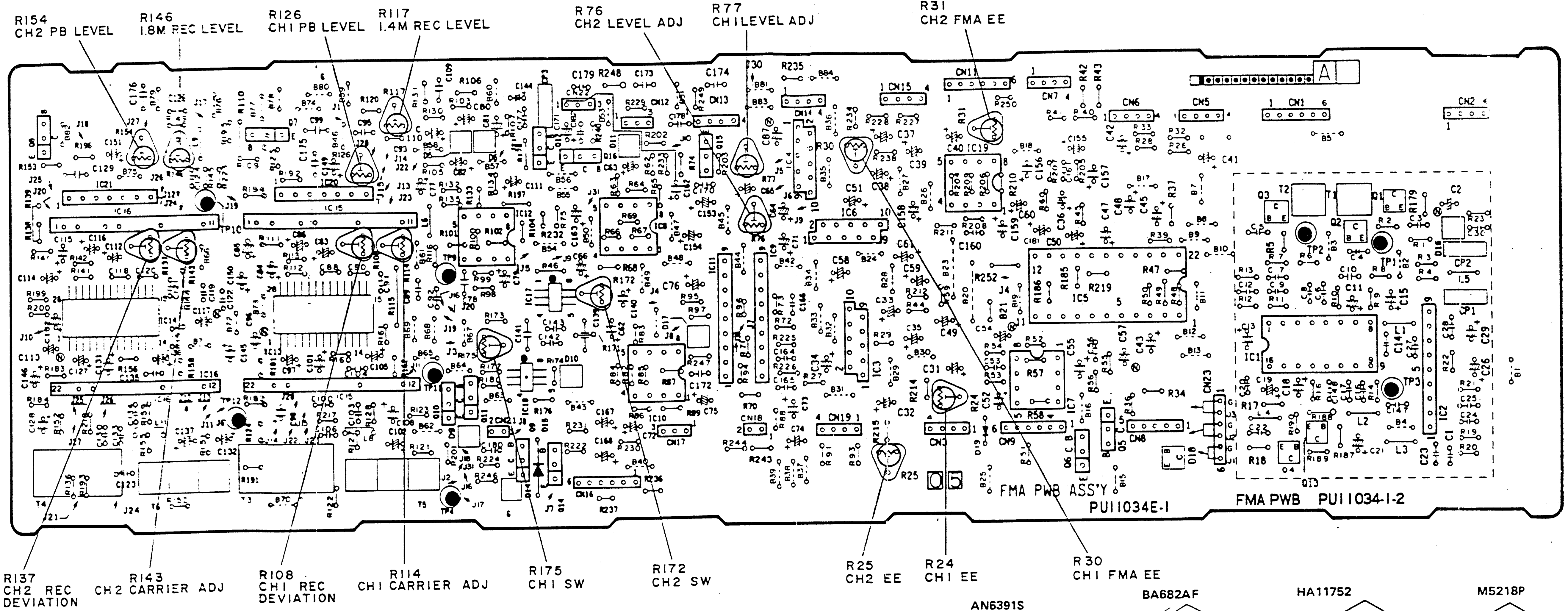

IC 18 BA634F
IC 17 BA226F
Q11 DTC124EF
IC8, IC10 M5218P
IC 20 7VT06
IC15 EHM-X42U508
IC 15
PEAK NR
DEEMP R192, C99
R126 CH-1 PB LEVEL
INTERPOLATION
10dB AMP
DIFFER-ENTIAL
DECODER
ENCODER
AGC CTL
Q7 DTC124EF
PREEMP C109, R131
<5V>
LEVEL LIMITER(± 50KHz)
IC 12 M5218P
D6 MC2836
D5 MC2836
<12V>
PREEMP C78, R99
IC 16 EHM-X42U508
IC 16
Q8 DTC124EF
IC 21 7VT06
R154 CH-2 PB LEVEL
DEEMP R196, C129
REST
FF
IC 18
IC 17
IC 10
D10 MC2836
R175 CH-1 SW
R172 CH-2 SW
HEAD SWITCHING
Q14 DTC124EF
R77 CH-1 LEVEL ADJ
R76 CH-2 LEVEL ADJ
Q10: TA78L005AP
5V REG
MUTING
IC 9
CHARGE LEVEL DET
MUT POWER ON
DISCHARGE
DISCHARGE LEVEL DET
TRIGGER AMP
IC 9 TA7324P
MUT POWER OFF
D15 OA90
Q15
Q12
CP
Q16
D11 MC2836
Q12, Q15 2SD545E,F
Q16 2SD545E,F
IC 11
IC 11 TA7324P
D17 MC2836
CN18 AUDIO GND
To 31 RF. MODULATOR CN 1
CN6 (R) IN GND GND (L) IN DRUM FF GND
From 04 AUDIO CN10,16
CN19 AUDIO R(MIXED) GND GND AUDIO L(MIXED)
To 10 TERMINAL CN4
CN17 PHONE (R) PHONE (L) GND
To 04 AUDIO CN14
CN15 HI-FI (R) GND GND HI-FI (L)
To 10 TERMINAL CN3
CN14 (L) OUT GND GND (R) OUT
To 04 AUDIO CN14
CN13 12V GND AUDIO IND OUT(L) AUDIO IND OUT(R)
CN21 MUT CTL PB CTL
From 04 MECHACON CN 213
CN22 SWD 12V GND UNSW 12V
From 04 AUDIO CN2
CN12 12V AUDIO LIM AUDIO LIM
LEFT RIGHT STEREO
NORMAL AUDIO
R150 10K
AUDIO MIXING CTL
HIFI — MIXING — NORMAL
04 AUDIO
29 AUDIO INDICATOR
IC 1: BA682AF
LEVEL IND DRIVER
L
R
D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12
D13 D14 D15 D16 D17 D18 D19 D20 D21 D22 D23 D24
IC1 & IC2: ACTIVE ONLY AT LOW WITH AUDIO LIMITER SW OFF
IC 2: BA682AF
CN5
OFF ON
AUDIO LIMITER SW 6
08 DISPLAY
H
I
J
K
M
N
O
P

Waveforms of FM audio circuit

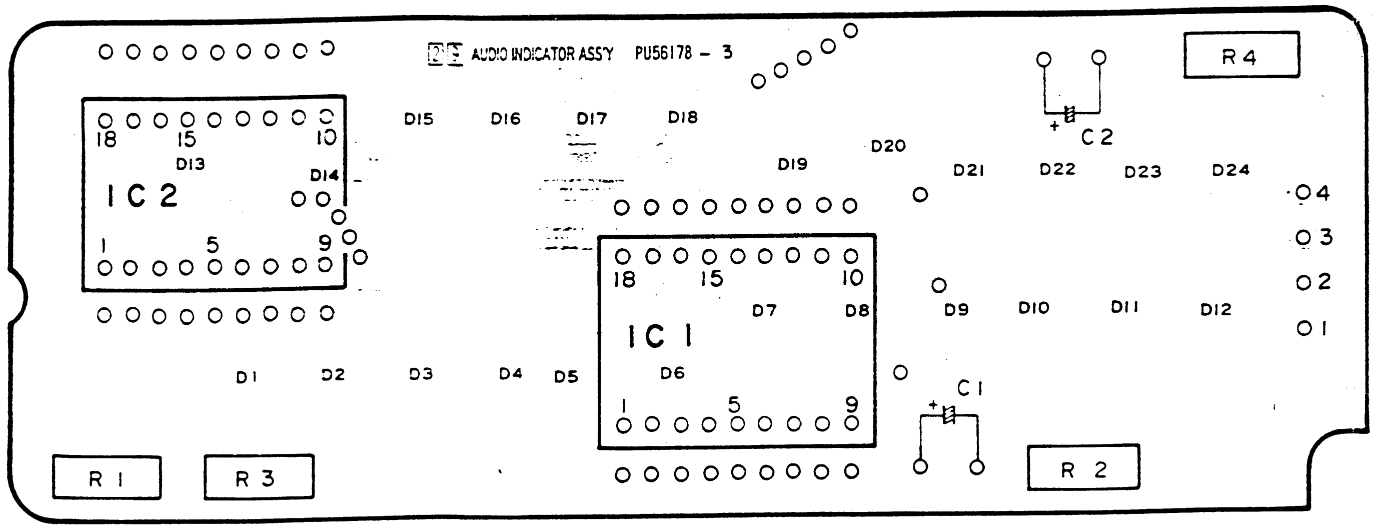


4.23 FM AUDIO AND AUDIO INDICATOR CIRCUIT BOARDS

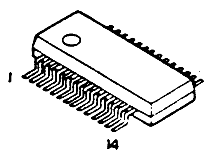
– FM AUDIO LEVEL INDICATOR –


R154
CH2 PB LEVEL
R146
1.8M REC LEVEL
R126
CH1 PB LEVEL
R117
1.4M REC LEVEL
R76
CH2 LEVEL ADJ
R77
CH1 LEVEL ADJ
R31
CH2 FMA EE
R137
CH2 REC DEVIATION
R143
CH2 CARRIER ADJ
R108
CH1 REC DEVIATION
R114
CH1 CARRIER ADJ
R175
CH1 SW
R172
CH2 SW
R25
CH2 EE
R24
CH1 EE
R30
CH1 FMA EE
FMA PWB ASS'Y
PU11034E-1
FMA PWB PU11034-1-2
A

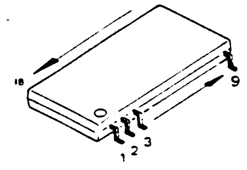
– AUDIO LEVEL INDICATOR –


AUDIO INDICATOR ASS'Y PU56178 – 3
R4
R1
R3
R2
C1
C2
IC1
IC2
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
D14
D15
D16
D17
D18
D19
D20
D21
D22
D23
D24
1
2
3
4

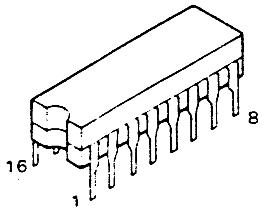
AN6391S



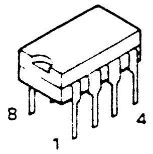
BA682AF



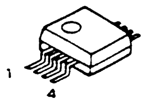
HA11752



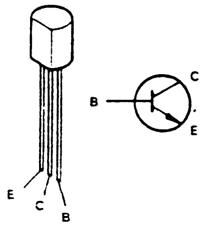
M5218P



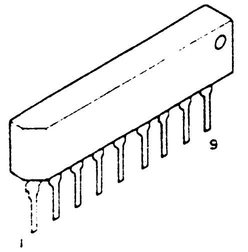
BA226F
BA634F



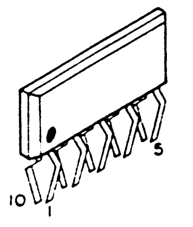
2SD545



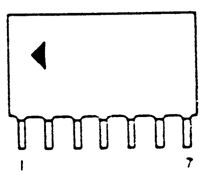
AN6392



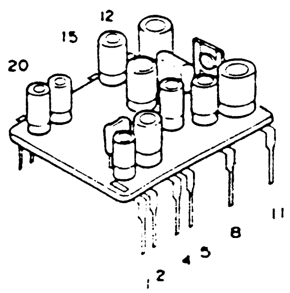
TK15021



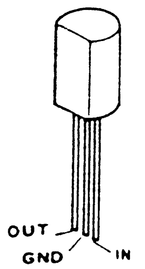
7VT06



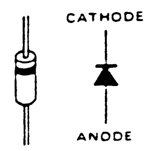
EHM-X42U50B


12
15
20
21
11
8
1 2
4 5

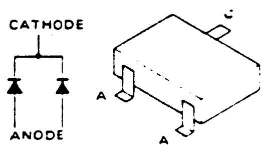
TA78L005AP



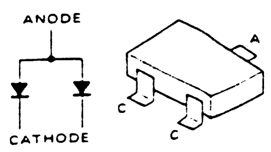
1SS133
OA90


CATHODE
ANODE

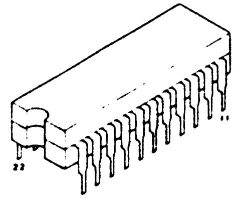
MC2838


CATHODE
ANODE
C
A
A

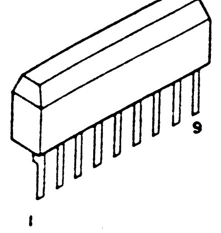
MC2836


ANODE
CATHODE
A
C
C

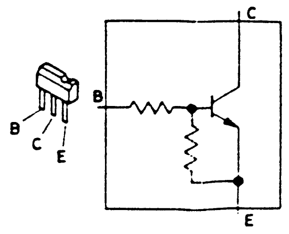
TK10322



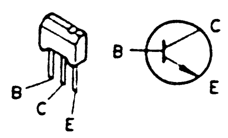
TA7324P



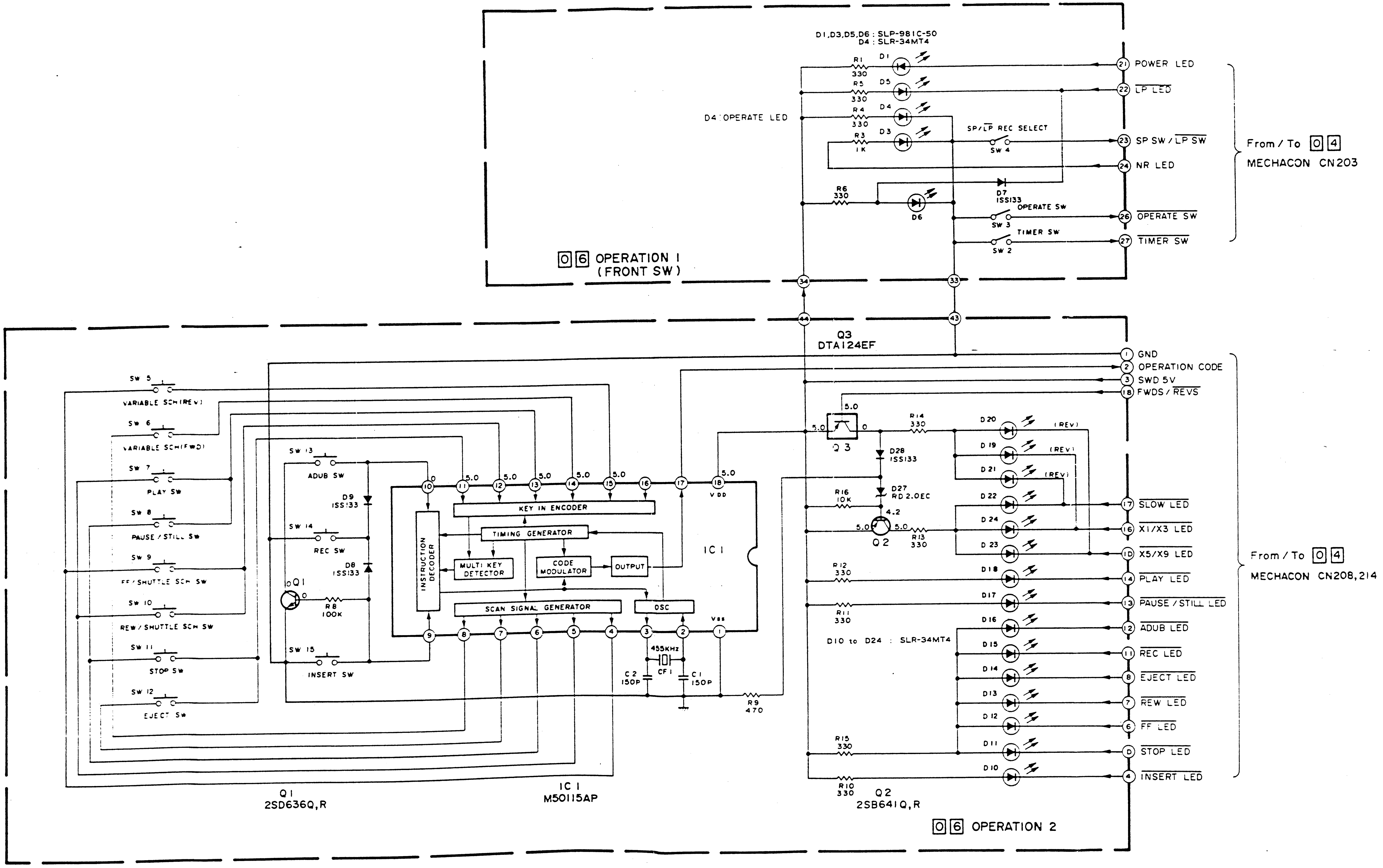
DTC124F



2SC2021
2SC3053



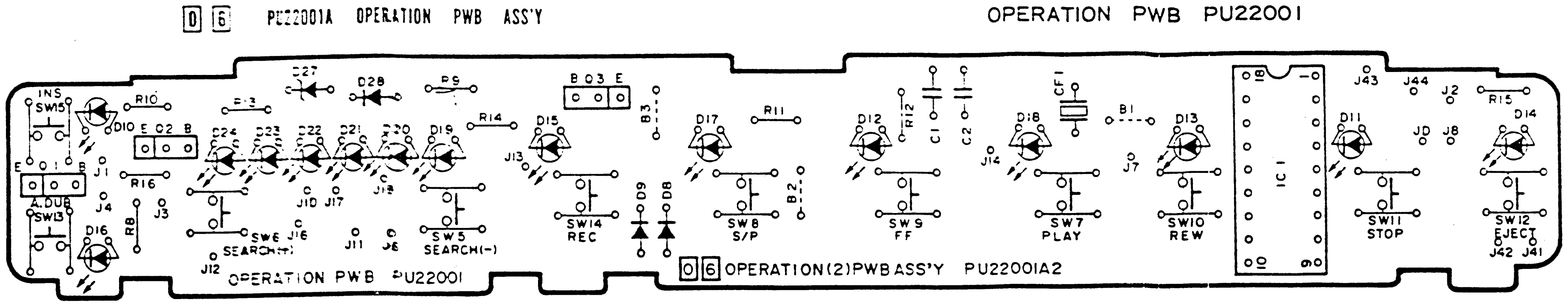
4.24 OPERATION SCHEMATIC DIAGRAM


D1,D3,D5,D6 : SLP-981C-50
D4 : SLR-34MT4
R1 330
D1
R5 330
D5
R4 330
D4
D4 : OPERATE LED
R3 1K
D3
SP/LP REC SELECT
SW 4
R6 330
D6
D7 1SS133
OPERATE SW
SW 3
TIMER SW
SW 2
21 POWER LED
22 LP LED
23 SP SW / LP SW
24 NR LED
26 OPERATE SW
27 TIMER SW
From / To 04
MECHACON CN203
06 OPERATION 1 (FRONT SW)
34
33
44
43
Q3 DTA124EF
1 GND
2 OPERATION CODE
3 SWD 5V
18 FWDS / REVS
SW 5
VARIABLE SCH(REV)
SW 6
VARIABLE SCH(FWD)
SW 7
PLAY SW
SW 8
PAUSE / STILL SW
SW 9
FF / SHUTTLE SCH SW
SW 10
REW / SHUTTLE SCH SW
SW 11
STOP SW
SW 12
EJECT SW
SW 13
ADUB SW
D9 1SS133
SW 14
REC SW
D8 1SS133
Q1
R8 100K
SW 15
INSERT SW
KEY IN ENCODER
TIMING GENERATOR
INSTRUCTION DECODER
MULTI KEY DETECTOR
CODE MODULATOR
OUTPUT
SCAN SIGNAL GENERATOR
OSC
IC 1
VDD
Vss
455KHz
CF1
C2 150P
C1 150P
R9 470
5.0
0
Q3
R14 330
D28 1SS133
D27 RD2.0EC
R16 10K
4.2
Q2
R13 330
R12 330
R11 330
D10 to D24 : SLR-34MT4
R15 330
R10 330
D20 (REV)
D19 (REV)
D21 (REV)
D22
D24
D23
D18
D17
D16
D15
D14
D13
D12
D11
D10
17 SLOW LED
16 X1/X3 LED
10 X5/X9 LED
14 PLAY LED
13 PAUSE / STILL LED
12 ADUB LED
11 REC LED
8 EJECT LED
7 REW LED
6 FF LED
D STOP LED
4 INSERT LED
From / To 04
MECHACON CN208,214
Q1 2SD636Q,R
IC1 M50115AP
Q2 2SB641Q,R
06 OPERATION 2
1
2
3
4
5
6
A
B
C
D
E
F
G
H

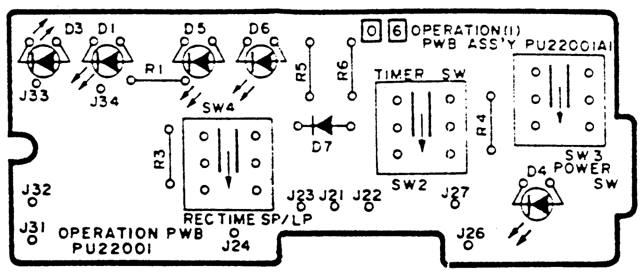
NOTE: Voltages are DC-measured with a digital voltmeter during stop mode.

4.25 OPERATION CIRCUIT BOARDS AND MODE SHIFT TABLE

– OPERATION 2 –


0 6 PU22001A OPERATION PWB ASS'Y
OPERATION PWB PU22001
INS SW15
A.DUB SW13
SW6 SEARCH(+)
SW5 SEARCH(–)
SW14 REC
SW8 S/P
SW9 FF
SW7 PLAY
SW10 REW
SW11 STOP
SW12 EJECT
IC1
OPERATION PWB PU22001
0 6 OPERATION(2)PWB ASS'Y PU22001A2

– OPERATION 1 –

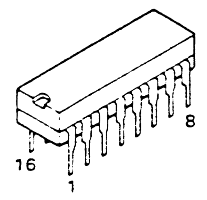

0 6 OPERATION(1) PWB ASS'Y PU22001A1
TIMER SW
SW2
SW3 POWER SW
SW4
REC TIME SP/LP
OPERATION PWB PU22001

– MODE SHIFT TABLE –

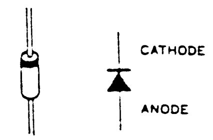
MODE / KEY	STOP	PLAY	STILL	SLOW SEARCH	FF	REW	REC	REC – PAUSE	A. DUB – PLAY	A. DUB – PAUSE	INSERT PLAY	INSERT PAUSE	INSTANT REC	TIMER REC
STOP		○	○	○	○	○	○	○	○	○	○	○	○	×
PLAY	○		○	○	○	○		○ (REC PLAY)		○ (A. DUB PLAY)		○ (INS PLAY)	×	×
PAUSE – STILL	×	○	○ (FADV)	○	×	×	○ (REC PAUSE)		○ (A. DUB PAUSE)	○ (FADV)	○ (INS PAUSE)		×	×
SLOW – SEARCH	×	○	○	○ (VSCH)	×	×	×	×	×	×	×	×	×	×
FF	○	○ (S. FF)	○ (S. FF)	○ (S. FF)		○	×	×	×	×	×	×	×	×
REW	○	○ (S. REW)	○ (S. REW)	○ (S. REW)	○		×	×	×	×	×	×	×	×
REC – PLAY	○	○	○	○	○	○		○	○	○	○	○	×	×
REC – PAUSE	○	○	○	○	○	○	○		○	○	○	○	×	×
A. DUB – PLAY	○	○	○	○	○	○	×	×		○	×	×	×	×
A. DUB – PAUSE	○	○	○	○	○	○	×	×	○		×	×	×	×
EJECT	○	○	○	○	○	○	×	×	×	×	×	×	×	×
INSTANT REC	○	○	○	○	○	○	○	○	○	○	○	○	○ (※1)	×
CH. UP DOWN	○	×	×	×	○	○	×	○	×	×	○	○	×	×

Notes:
○ : Enabled (mode changes)
× : Inhibited (mode does not change)
※1 : Rec time advance

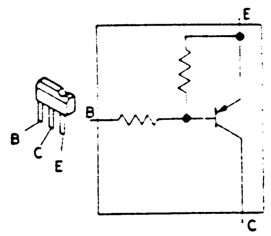
M50115AP



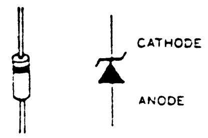
1SS133


CATHODE
ANODE

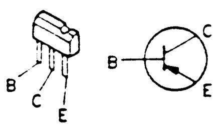
DTA124EF



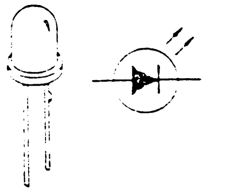
RD2.0EC


CATHODE
ANODE

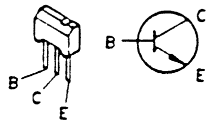
2SB641



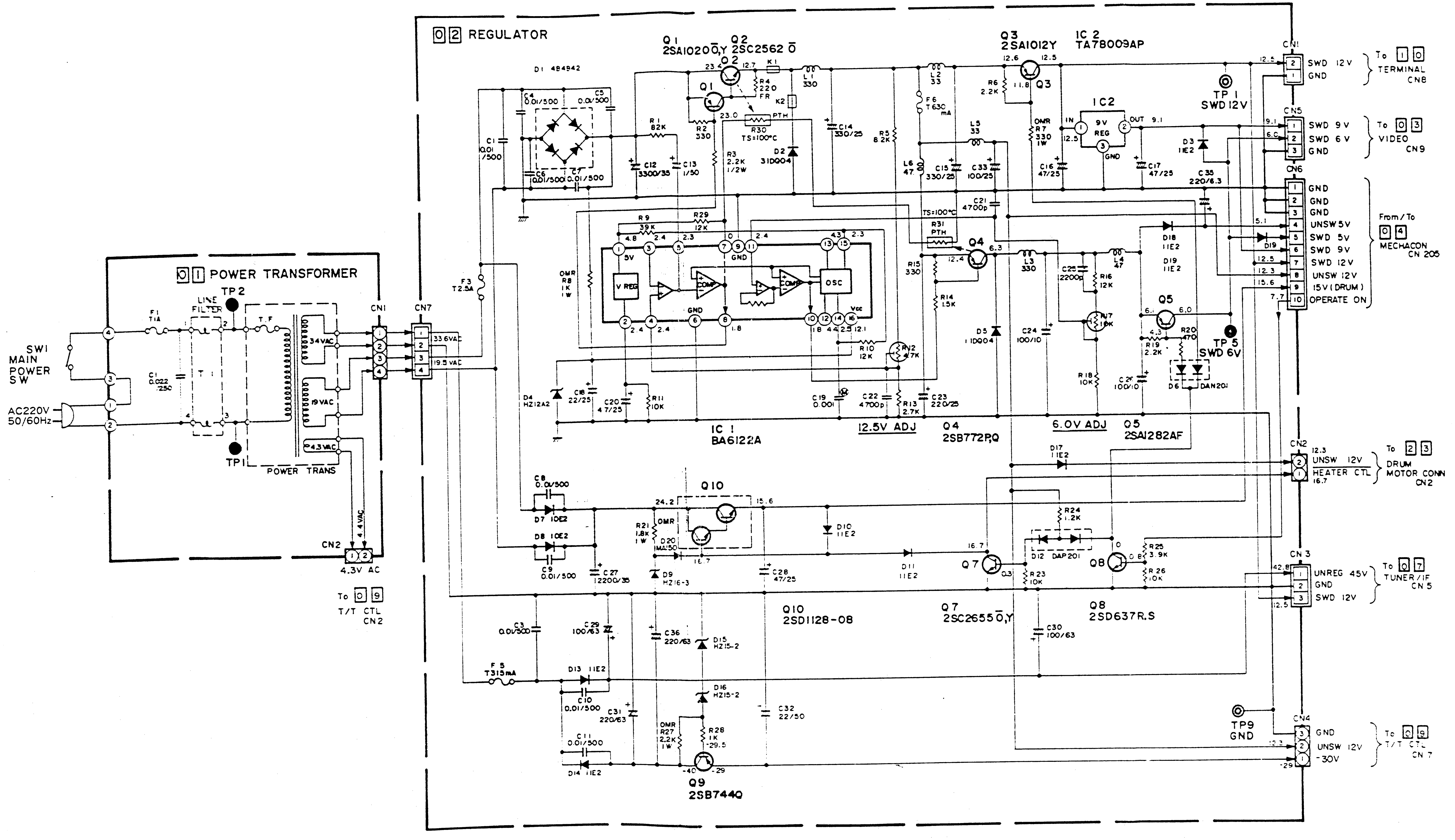
SLR-34MT4
SLP-981C-50



2SD636



4.26 REGULATOR SCHEMATIC DIAGRAM

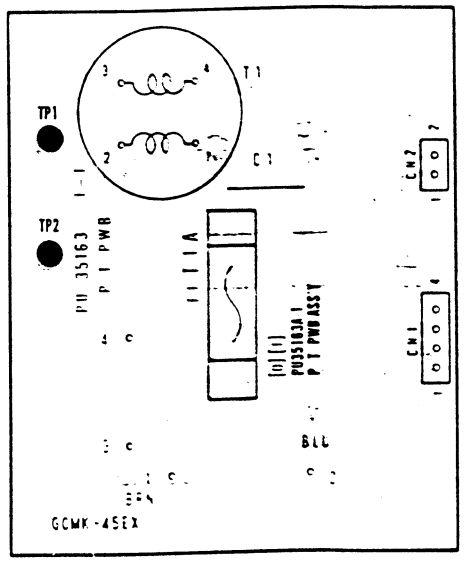


01 POWER TRANSFORMER
TP2
TP1
LINE FILTER
F1 T1A
C1 0.022 /250
T.F
34VAC
19VAC
4.3VAC
POWER TRANS
CN1
CN2
4.4VAC
4.3V AC
To 09 T/T CTL CN2
SW1 MAIN POWER SW
AC220V 50/60Hz
02 REGULATOR
CN7
33.6VAC
19.5VAC
F3 T2.5A
D1 4B4942
C4 0.01/500
C5 0.01/500
C1 0.01 /500
C6 0.01/500
C7 0.01/500
R1 82K
C12 3300/35
C13 1/50
Q1 2SA1020O,Y
Q2 2SC2562 O
R2 330
R3 2.2K 1/2W
R4 220 FR
K1
K2
R30 PTH TS=100°C
D2 31DQ04
L1 330
C14 330/25
R5 8.2K
L2 33
F6 T630mA
L6 47
C15 330/25
C33 100/25
L5 33
Q3 2SA1012Y
R6 2.2K
OMR R7 330 1W
IC2 TA78009AP
9V REG
C16 47/25
C17 47/25
TP1 SWD 12V
D3 11E2
C35 220/6.3
C21 4700p
R31 PTH TS=100°C
Q4
R15 330
R14 1.5K
L3 330
C25 12200p
R16 12K
L4 47
D18 11E2
D19 11E2
R9 39K
R29 12K
V REG
COMP
OSC
GND
Vcc
OMR R8 1K 1W
D4 HZ12A2
C18 22/25
C20 47/25
R11 10K
R10 12K
VR2 4.7K
C19 0.001
C22 4700p
R13 2.7K
C23 220/25
D5 11DQ04
C24 100/10
VR1 10K
Q5
R19 2.2K
R20 470
TP5 SWD 6V
D6 DAN201
R18 10K
C26 100/10
IC1 BA6122A
12.5V ADJ
Q4 2SB772P,Q
6.0V ADJ
Q5 2SA1282AF
CN1 SWD 12V GND
To 10 TERMINAL CN8
CN5 SWD 9V SWD 6V GND
To 03 VIDEO CN9
CN6 GND GND GND UNSW5V SWD 5V SWD 9V SWD 12V UNSW 12V 15V(DRUM) OPERATE ON
From/To 04 MECHACON CN205
C8 0.01/500
D7 10E2
D8 10E2
C9 0.01/500
C27 12200/35
Q10
R21 1.8K 1W
OMR D20 1MA150
D9 HZ16-3
C28 47/25
D10 11E2
D11 11E2
D17 11E2
R24 1.2K
D12 DAP201
Q7
Q8
R23 10K
R25 3.9K
R26 10K
CN2 UNSW 12V HEATER CTL
To 23 DRUM MOTOR CONN CN2
CN3 UNREG 45V GND SWD 12V
To 07 TUNER/IF CN5
Q10 2SD1128-08
Q7 2SC2655O,Y
Q8 2SD637R,S
C3 0.01/500
C29 100/63
C36 220/63
D15 HZ15-2
C30 100/63
F5 T315mA
D13 11E2
C10 0.01/500
C31 220/63
D16 HZ15-2
C32 22/50
OMR R27 2.2K 1W
R28 1K
C11 0.01/500
D14 11E2
Q9 2SB744Q
TP9 GND
CN4 GND UNSW 12V -30V
To 09 T/T CTL CN7

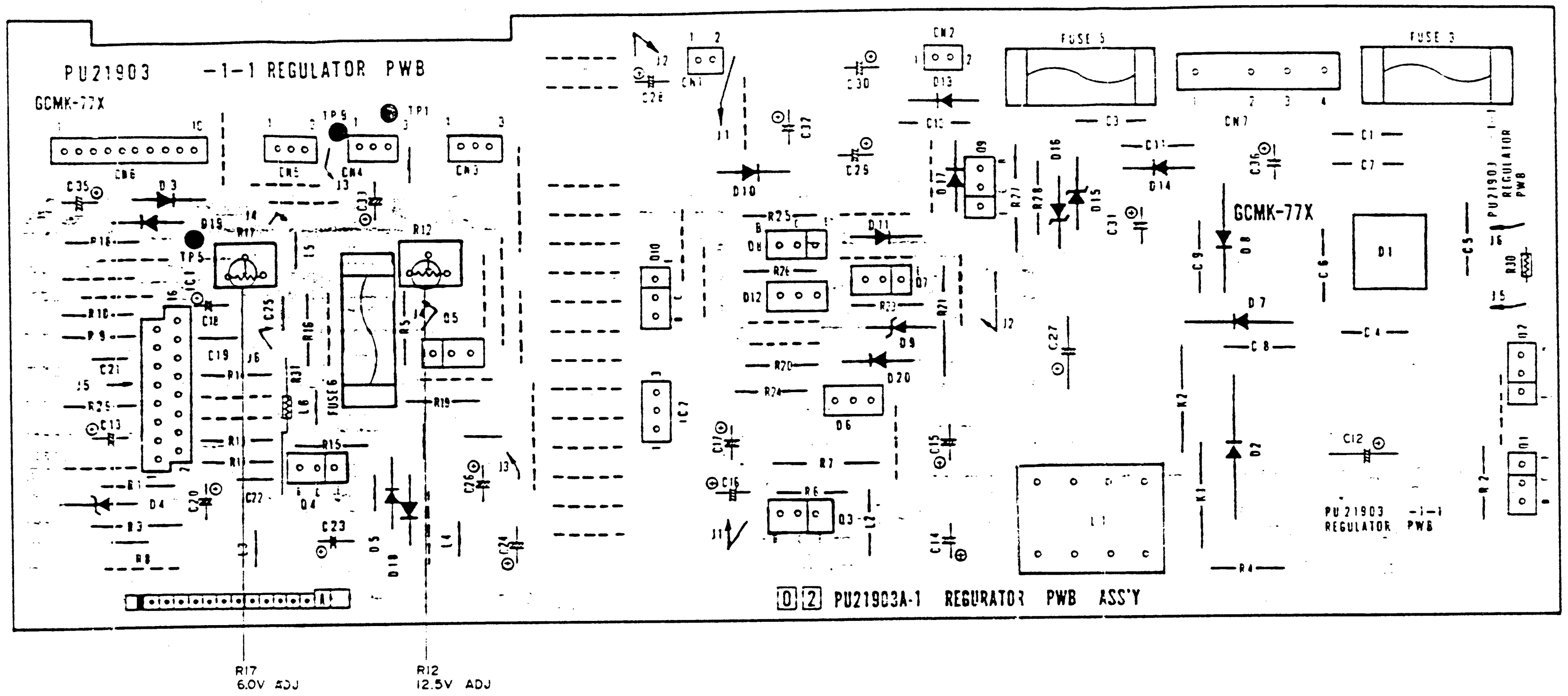
NOTES: Unless otherwise specified.
1. All resistance values are in ohms. (1/8 W)
2. All inductance values are in μH.
3. All capacitance values are in μF.
4. Voltages are DC-measured with a digital voltmeter during stop mode.
5. Shaded ( ) parts are critical for safety. Replace only with specified part numbers.

4.27 POWER TRANSFORMER AND REGULATOR CIRCUIT BOARDS

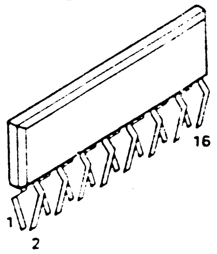
– POWER TRANSFORMER –


TP1
TP2
T1
PU35163A-1
P T PWB ASS'Y
GCMK-45EX

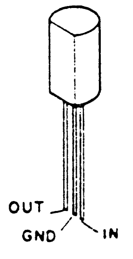
– REGULATOR –


PU21903 -1-1 REGULATOR PWB
GCMK-77X
FUSE 5
FUSE 3
FUSE 6
TP1
TP5
PU21903A-1 REGURATOR PWB ASS'Y
R17
6.0V ADJ
R12
12.5V ADJ

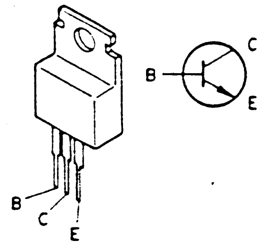
BA6122A



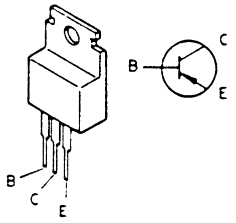
TA78009AP



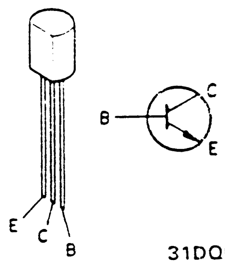
2SD1128-08
2SC2562



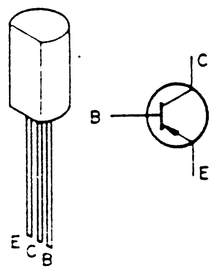
2SA1012
2SA1020



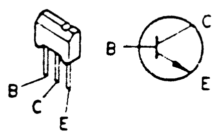
2SC2655



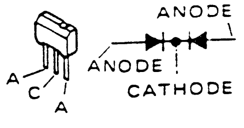
2SA1282



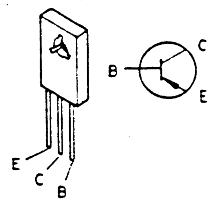
2SD637



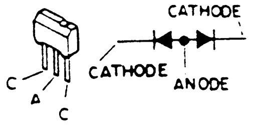
DAN201


ANODE
ANODE
CATHODE
A
C
A

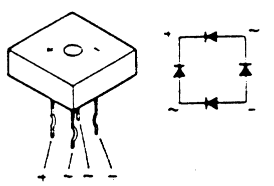
2SB772
2SB744



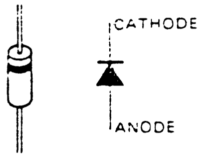
DAP201


CATHODE
CATHODE
ANODE
C
A
C

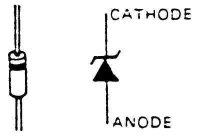
4B4B42



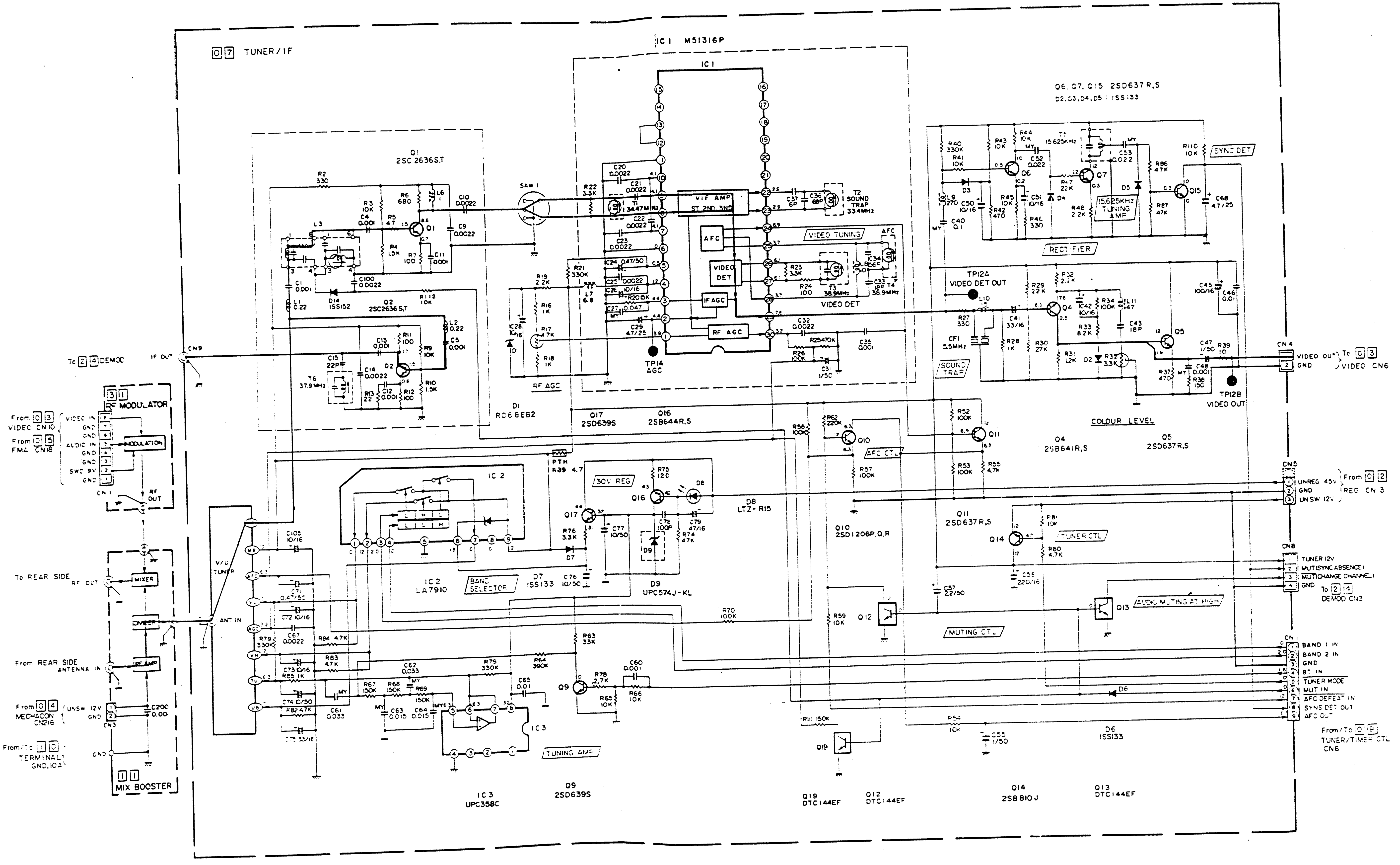
31DQ04
11DQ04
11E2
10E2
MA150


CATHODE
ANODE

HZ15-2
HZ16-3
HZ12A2

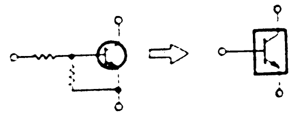

CATHODE
ANODE

4.28 TUNER/IF SCHEMATIC DIAGRAM


07 TUNER/IF
IC1 M51316P
IC1
Q6, Q7, Q15 2SD637R,S
D2, D3, D4, D5 : 1SS133
Q1 2SC2636S,T
Q2 2SC2636S,T
D14 1SS152
T6 37.9MHz
SAW1
VIF AMP ST 2ND 3RD
AFC
VIDEO DET
IF AGC
RF AGC
VIDEO TUNING
VIDEO DET
T1 34.47MHz
T2 SOUND TRAP 33.4MHz
T3 38.9MHz
T4 38.9MHz
TP14 AGC
RF AGC
D1 RD6.8EB2
TP12A VIDEO DET OUT
TP12B VIDEO OUT
SYNC DET
RECTIFIER
T5 15625KHz
15625KHz TUNING AMP
CF1 5.5MHz
SOUND TRAP
COLOUR LEVEL
Q4 2SB641R,S
Q5 2SD637R,S
CN4
VIDEO OUT
GND
To 03 VIDEO CN6
IF OUT
CN9
To 24 DEMOD
31 MODULATOR
From 03 VIDEO CN10
From 05 FMA CN18
VIDEO IN
GND
AUDIO IN
SWD 9V
MODULATION
RF OUT
To REAR SIDE RF OUT
MIXER
DIVIDER
RF AMP
From REAR SIDE ANTENNA IN
ANT IN
From 04 MECHACON CN216
UNSW 12V
GND
CN3
From/To 10 TERMINAL GND, 10A
11 MIX BOOSTER
V/U TUNER
MB
AFC
AGC
VH
TU
VS
IC2
IC2 LA7910
BAND SELECTOR
PTH
R39 4.7
30V REG
Q17 2SD639S
Q16 2SB644R,S
D7 1SS133
D8 LTZ-R15
D9 UPC574J-KL
AFC CTL
Q10 2SD1206P,Q,R
Q11 2SD637R,S
TUNER CTL
Q14
AUDIO MUTING AT HIGH
MUTING CTL
TUNING AMP
IC3 UPC358C
Q9 2SD639S
Q19 DTC144EF
Q12 DTC144EF
Q14 2SB810J
Q13 DTC144EF
D6 1SS133
CN5
UNREG 45V
GND
UNSW 12V
From 02 REG CN3
CN8
TUNER 12V
MUT(SYNC ABSENCE)
MUT(CHANGE CHANNEL)
GND
To 24 DEMOD CN3
CN1
BAND 1 IN
BAND 2 IN
GND
BT IN
TUNER MODE
MUT IN
AFC DEFEAT IN
SYNC DET OUT
AFC OUT
From/To 09 TUNER/TIMER CTL CN6

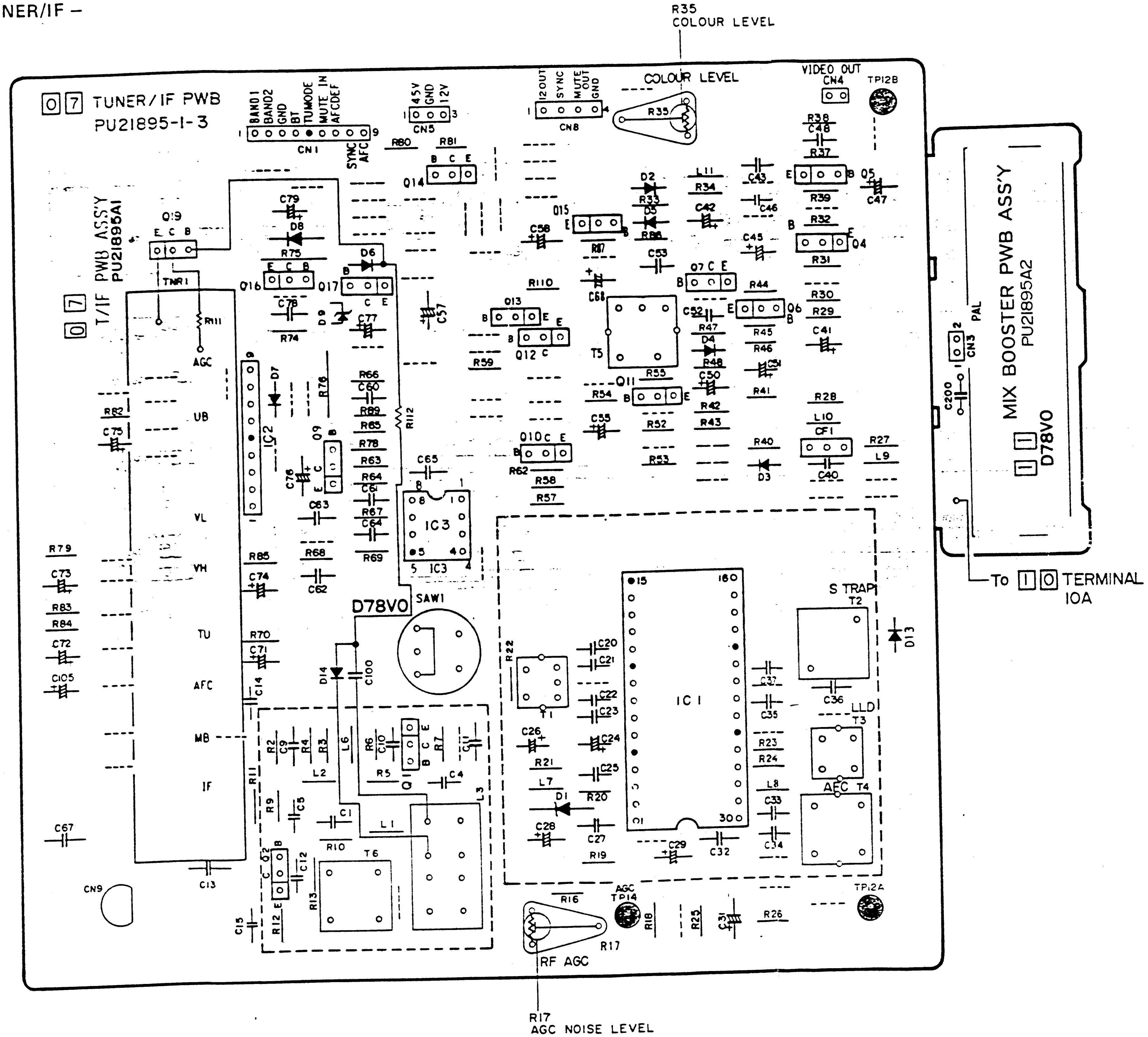
NOTES: Unless otherwise specified.
1. All resistance values are in ohms (1/6 W)
2. All inductance values are in μH.
3. All capacitance values are in μF.
4. Voltages are DC-measured with a digital voltmeter during receiving a color broadcast.

5. The digital transistor is a transistor that includes built in resistors. Both PNP and NPN types are available.
6. Shaded ( ) parts are critical for safety. Replace only with specified part numbers.

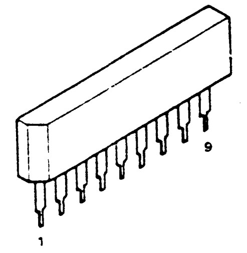


4.29 TUNER/IF AND MIX BOOSTER (RF SW) CIRCUIT BOARD

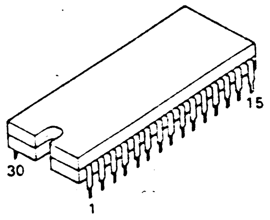
– TUNER/IF –


R35
COLOUR LEVEL
07 TUNER/IF PWB
PU21895-1-3
07 T/IF PWB ASS'Y
PU21895A1
BAND1 BAND2 GND BT TUMODE MUTE IN AFCDEF
CN1
SYNC AFC
45V GND 12V
CN5
12OUT SYNC MUTE OUT GND
CN8
COLOUR LEVEL
VIDEO OUT
CN4
TP12B
TNR1
AGC
UB
VL
VH
TU
AFC
MB
IF
IC2
IC3
IC1
T5
D78V0
SAW1
S TRAP
T2
LLD
T3
AFC
T4
AGC
TP14
TP12A
CN9
RF AGC
R17
AGC NOISE LEVEL
MIX BOOSTER PWB ASS'Y
PU21895A2
11 D78V0
PAL
CN3
To 10 TERMINAL
10A

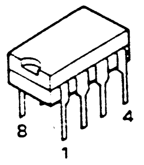
LA7910



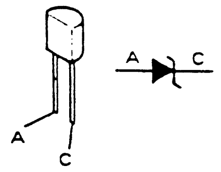
M51316P



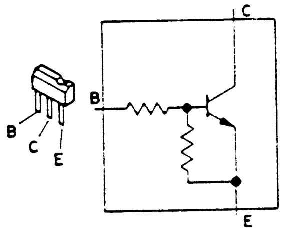
UPC358C



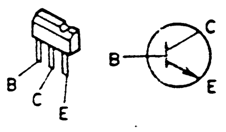
UPC574J-KL



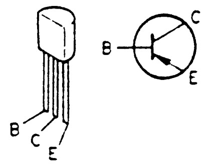
DTC144EF



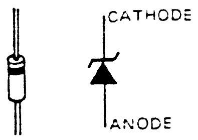
2SD1206
2SC2636
2SD637
2SD639



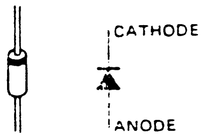
2SB641
2SB810
2SB644



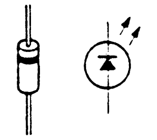
RD6.8EB2


CATHODE
ANODE

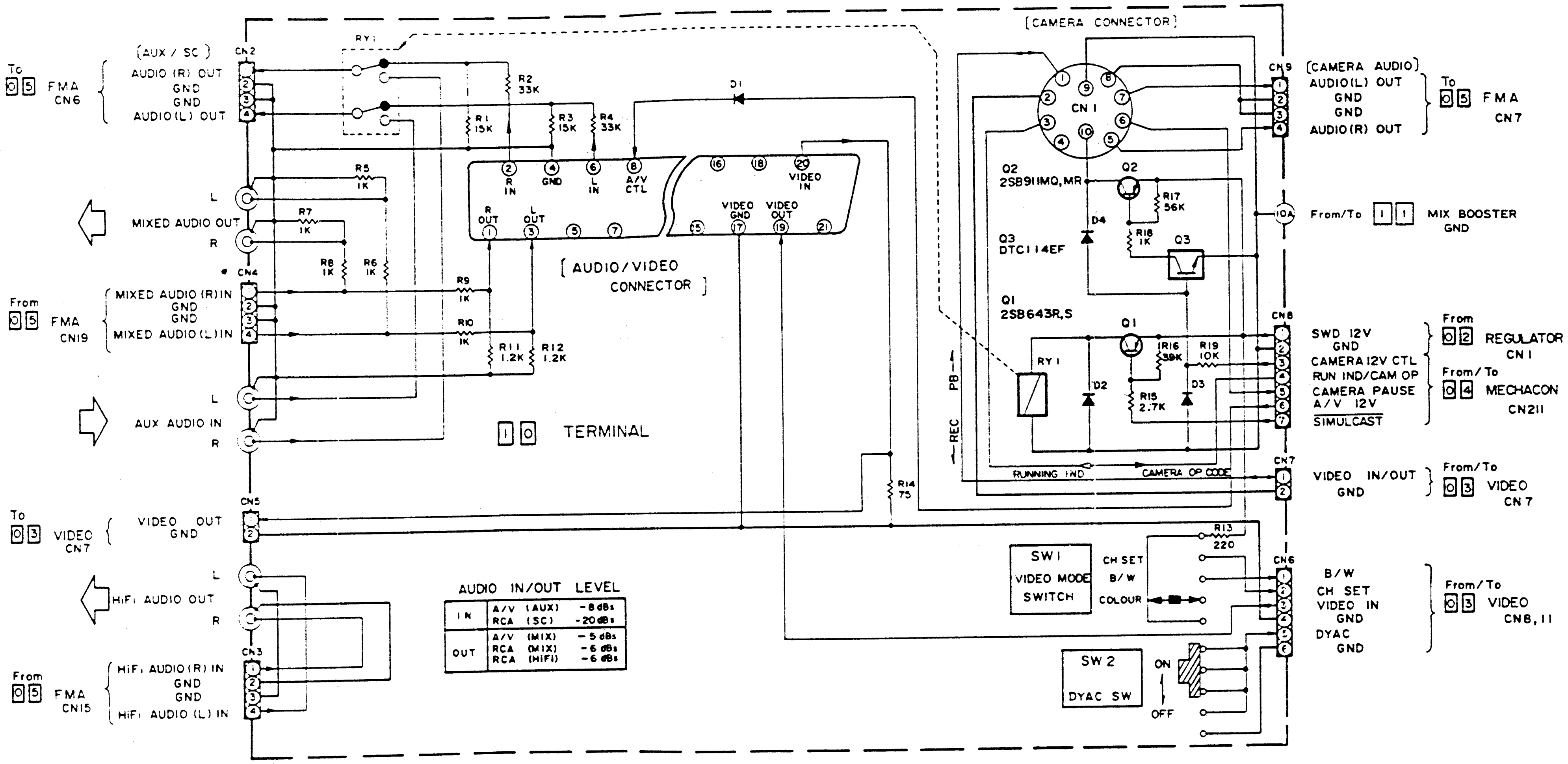
1SS152
1SS133


CATHODE
ANODE

LTZ-R15



4.30 TERMINAL SCHEMATIC DIAGRAM


To
0 5 FMA CN6
(AUX / SC)
CN2
AUDIO (R) OUT
GND
GND
AUDIO (L) OUT
RY1
R1 15K
R2 33K
R3 15K
R4 33K
D1
MIXED AUDIO OUT
L
R
R5 1K
R7 1K
R8 1K
R6 1K
CN4
From
0 5 FMA CN19
MIXED AUDIO (R) IN
GND
GND
MIXED AUDIO (L) IN
R9 1K
R10 1K
R11 1.2K
R12 1.2K
AUX AUDIO IN
R IN
GND
L IN
A/V CTL
R OUT
L OUT
VIDEO IN
VIDEO GND
VIDEO OUT
[AUDIO/VIDEO CONNECTOR]
1 0 TERMINAL
R14 75
To
0 3 VIDEO CN7
CN5
VIDEO OUT
GND
HiFi AUDIO OUT
From
0 5 FMA CN15
CN3
HiFi AUDIO (R) IN
GND
GND
HiFi AUDIO (L) IN
[CAMERA CONNECTOR]
CN1
Q2 2SB911MQ,MR
Q2
R17 56K
D4
Q3 DTC114EF
R18 1K
Q3
Q1 2SB643R,S
Q1
RY1
D2
R16 39K
R19 10K
R15 2.7K
D3
PB
REC
RUNNING IND
CAMERA OP CODE
CN9
[CAMERA AUDIO]
AUDIO(L) OUT
GND
GND
AUDIO(R) OUT
To
0 5 FMA CN7
10A
From/To 1 1 MIX BOOSTER GND
CN8
SWD 12V
GND
CAMERA 12V CTL
RUN IND/CAM OP
CAMERA PAUSE
A/V 12V
SIMULCAST
From
0 2 REGULATOR CN1
From/To
0 4 MECHACON CN211
CN7
VIDEO IN/OUT
GND
From/To
0 3 VIDEO CN7
R13 220
SW1 VIDEO MODE SWITCH
CH SET
B/W
COLOUR
CN6
B/W
CH SET
VIDEO IN
GND
DYAC
GND
From/To
0 3 VIDEO CN8, 11
SW2 DYAC SW
ON
OFF

AUDIO IN/OUT LEVEL

IN	A/V (AUX) RCA (SC)	-8 dBs -20 dBs
OUT	A/V (MIX) RCA (MIX) RCA (HIFI)	-5 dBs -6 dBs -6 dBs

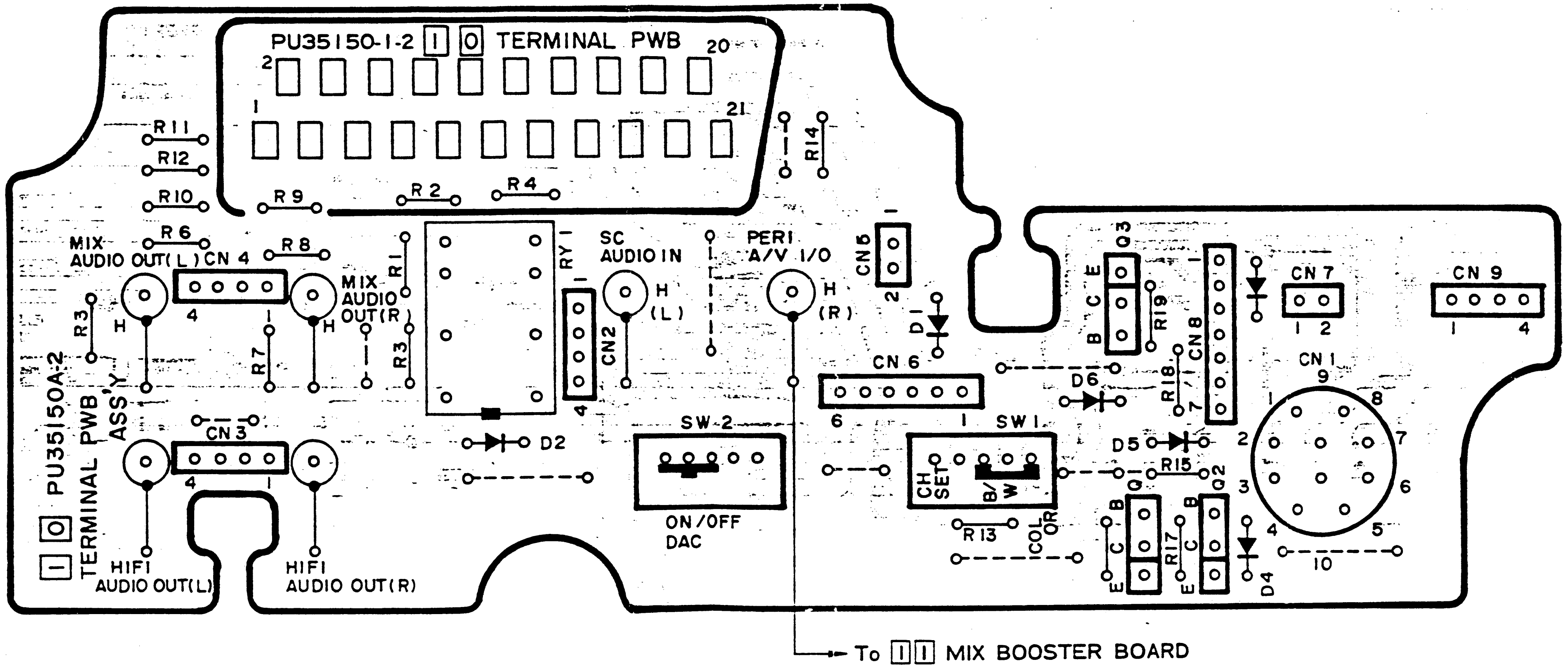
CN1
CAMERA CONNECTOR

No.	NAME
①	VIDEO IN/OUT
②	GND (VIDEO)
③	RUNNING IND.OUT
④	NC
⑤	AUDIO (R) IN
⑥	CAMERA PAUSE IN
⑦	AUDIO(L) IN
⑧	GND (AUDIO)
⑨	GND
⑩	CAMERA 12V OUT

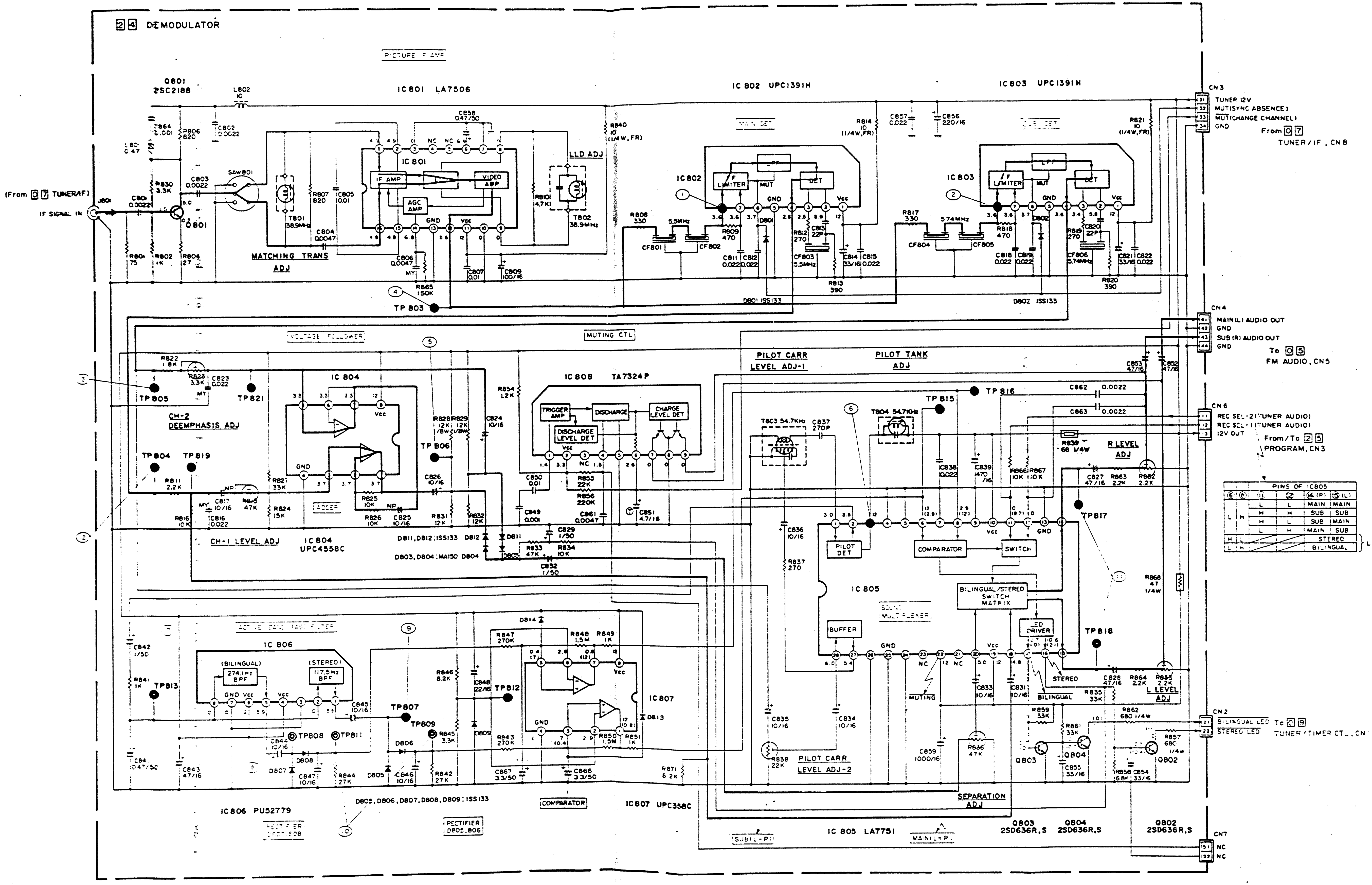
NOTES: Unless otherwise specified,

1. Shaded (   ) parts are critical for safety. Replace only with specified part numbers.
2. All resistance values are in ohms, 1/6 W.
3. All diodes are 1SS133.

4.31 TERMINAL CIRCUIT BOARD


PU35150-1-2 1 0 TERMINAL PWB
2
20
1
21
R11
R12
R10
R9
R2
R4
R14
R6
R8
MIX AUDIO OUT(L)
CN 4
4
1
MIX AUDIO OUT(R)
H
H
R3
R7
R1
R3
RY1
1
4
CN2
SC AUDIO IN
H (L)
PERI A/V I/O
H (R)
CN5
1
2
D1
CN 6
6
1
D2
SW-2
ON/OFF DAC
SW1
CH SET
B/W
COL OR
R13
CN3
4
1
HIFI AUDIO OUT(L)
HIFI AUDIO OUT(R)
1 0 PU35150A-2 TERMINAL PWB ASS'Y
Q3
E
C
B
R19
CN8
7
1
R18
D6
D5
R15
Q1
B
C
E
R17
Q2
C
B
E
D4
CN 7
1 2
CN 9
1
4
CN 1
9
8
7
6
5
4
3
2
1
10
To 1 1 MIX BOOSTER BOARD

4.32 DEMODULATOR SCHEMATIC DIAGRAM



2 4 DEMODULATOR
PICTURE IF AMP
Q801 2SC2188
L802 10
IC801 LA7506
IC802 UPC1391H
IC803 UPC1391H
CN3
TUNER 12V
MUT(SYNC ABSENCE)
MUT(CHANGE CHANNEL)
GND
From 0 7 TUNER/IF, CN8
(From 0 7 TUNER/IF)
IF SIGNAL IN
J801
C801 0.0022
R830 3.3K
C803 0.0022
SAW801
R801 75
R802 1K
R804 27
R806 820
C802 0.0022
C864 0.001
L801 0.47
T801 38.9MHz
R807 820
C805 0.001
C804 0.0047
MATCHING TRANS ADJ
IF AMP
AGC AMP
VIDEO AMP
C858 0.47/50
C806 0.0047
R865 150K
C807 0.01
C809 100/16
LLD ADJ
R8101 4.7K
T802 38.9MHz
R840 10 (1/4W,FR)
MAIN DET
SUB DET
LIMITER
MUT
LPF
DET
GND
Vcc
R808 330
5.5MHz
CF801
CF802
R809 470
D801
R812 270
C813 22P
CF803 5.5MHz
C811 0.022
C812 0.022
C814 33/16
C815 0.022
R813 390
R814 10 (1/4W,FR)
C857 0.022
C856 220/16
R817 330
5.74MHz
CF804
CF805
R818 470
D802
R819 270
C820 22P
CF806 5.74MHz
C818 0.022
C819 0.022
C821 33/16
C822 0.022
R820 390
R821 10 (1/4W,FR)
D801 1SS133
D802 1SS133
TP803
CN4
MAIN(L) AUDIO OUT
GND
SUB(R) AUDIO OUT
GND
To 0 5 FM AUDIO, CN5
VOLTAGE FOLLOWER
MUTING CTL
R822 1.8K
R823 3.3K
C823 0.022
TP805
TP821
CH-2 DEEMPHASIS ADJ
IC804
TP804
TP819
R811 2.2K
C817 10/16
R815 47K
R816 10K
C816 0.022
R824 15K
R827 33K
LADDER
R825 10K
R826 10K
C825 10/16
CH-1 LEVEL ADJ
IC804 UPC4558C
R828 12K
R829 12K
C824 10/16
TP806
C826 10/16
R831 12K
R832 12K
D811, D812: 1SS133
D803, D804: MA150
R854 1.2K
IC808 TA7324P
TRIGGER AMP
DISCHARGE
CHARGE LEVEL DET
DISCHARGE LEVEL DET
C850 0.01
C849 0.001
R855 22K
R856 220K
C861 0.0047
C851 4.7/16
C829 1/50
R833 47K
R834 10K
C832 1/50
PILOT CARR LEVEL ADJ-1
PILOT TANK ADJ
TP816
TP815
T803 54.7KHz
C837 270P
T804 54.7KHz
C853 47/16
C852 47/16
C862 0.0022
C863 0.0022
C836 10/16
R837 270
C838 0.022
C839 470/16
R866 10K
R867 10K
R839 68 1/4W
R LEVEL ADJ
C827 47/16
R863 2.2K
R862 2.2K
TP817
PILOT DET
COMPARATOR
SWITCH
BILINGUAL/STEREO SWITCH MATRIX
SOUND MULTIPLEXER
BUFFER
LED DRIVER
IC805
TP818
R868 47 1/4W
CN6
REC SEL-2(TUNER AUDIO)
REC SEL-1(TUNER AUDIO)
12V OUT
From/To 2 5 PROGRAM, CN3
ACTIVE BAND PASS FILTER
IC806
(BILINGUAL) 274.1Hz BPF
(STEREO) 117.5Hz BPF
C842 1/50
R841 1K
TP813
C84 0.47/50
C843 47/16
C845 10/16
C844 10/16
TP808
TP811
TP807
TP809
D808
D807
C847 10/16
R844 27K
D805
D806
C846 10/16
R842 27K
R845 3.3K
R846 8.2K
C848 22/16
TP812
D809
D814
R847 270K
R848 1.5M
R849 1K
IC807
D813
R843 270K
R850 1.5M
R851 1K
C867 3.3/50
C866 3.3/50
COMPARATOR
D805, D806, D807, D808, D809: 1SS133
IC806 PU52779
RECTIFIER D807, 808
RECTIFIER D805, 806
IC807 UPC358C
R871 8.2K
C835 10/16
C834 10/16
R838 22K
PILOT CARR LEVEL ADJ-2
MUTING
C833 10/16
C831 10/16
STEREO
BILINGUAL
C859 1000/16
R846 47K
SEPARATION ADJ
C828 47/16
R864 2.2K
R853 2.2K
L LEVEL ADJ
R835 33K
R859 33K
R861 33K
Q803
Q804
C855 33/16
R862 680 1/4W
R857 680 1/4W
Q802
R858 6.8K
C854 33/16
CN2
BILINGUAL LED
STEREO LED
To 1 9 TUNER/TIMER CTL, CN
IC805 LA7751
SUB(L+R)
MAIN(L+R)
Q803 2SD636R,S
Q804 2SD636R,S
Q802 2SD636R,S
CN7
NC
NC

		PINS OF IC805			
⑥	⑦	⑪	⑫	⑭(R)	⑮(L)
L	H	L	L	MAIN	MAIN
		H	H	SUB	SUB
		H	L	SUB	MAIN
		L	H	MAIN	SUB
H	L			STEREO	
L	H			BILINGUAL	

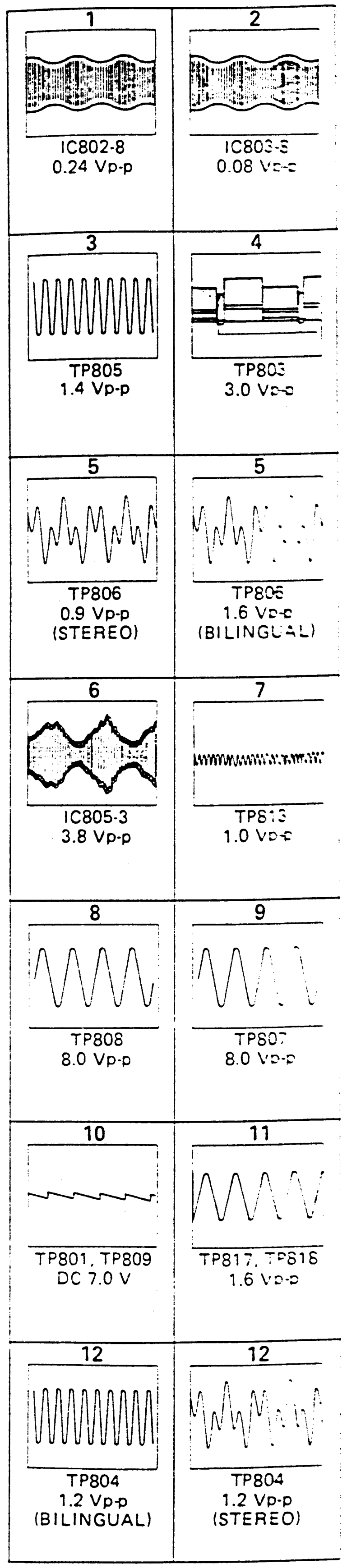
LED

NOTES: Unless otherwise specified,

1. All diodes are 1SS133.
2. All resistance values are in Ohms. (1/6 W)
3. All inductance values are in μH.
4. All capacitance values are in μF.
5. Voltages are DC-Measured with a digital voltmeter during receiving a stereo broadcast.
6. Where voltage differs between stereo and bilingual the voltage during bilingual is shown is parentheses.
7. Waveforms are measured with a color bar during stereo and bilingual broadcast.
8. Shaded (   ) parts are critical for sarety. Replace only with specified part numbers.

4.33 DEMODULATOR CIRCUIT BOARD

Waveforms of demodulator circuit



1 IC802-8 0.24 Vp-p

2 IC803-8 0.08 Vp-p

3 TP805 1.4 Vp-p

4 TP803 3.0 Vp-p

5 TP806 0.9 Vp-p (STEREO)

5 TP806 1.6 Vp-p (BILINGUAL)

6 IC805-3 3.8 Vp-p

7 TP813 1.0 Vp-p

8 TP808 8.0 Vp-p

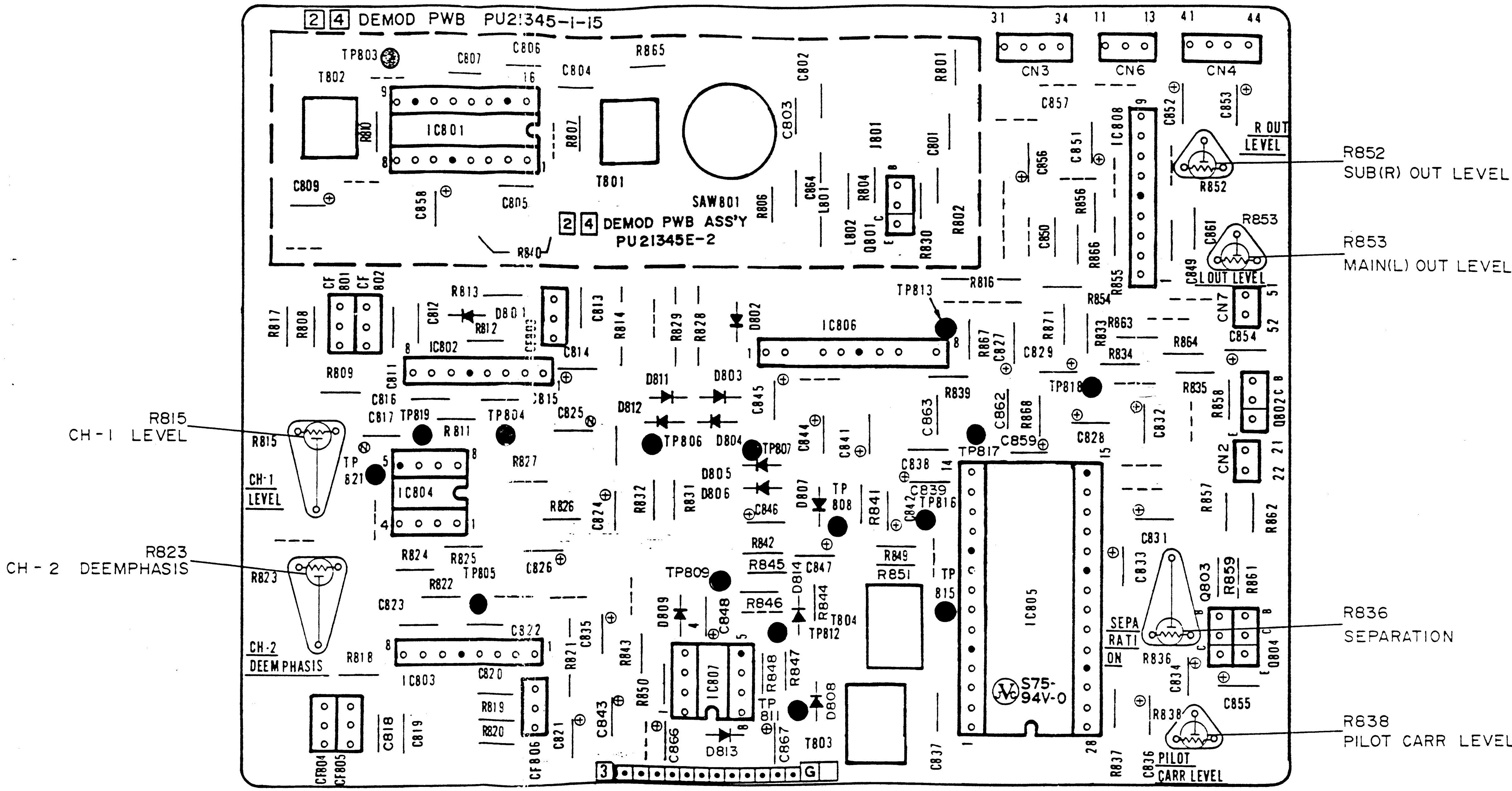
9 TP807 8.0 Vp-p

10 TP801, TP809 DC 7.0 V

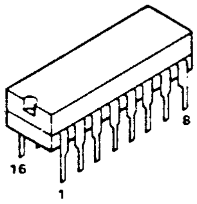
11 TP817, TP816 1.6 Vp-p

12 TP804 1.2 Vp-p (BILINGUAL)

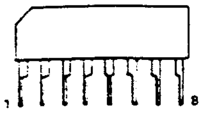
12 TP804 1.2 Vp-p (STEREO)


2 4 DEMOD PWB PU21345-1-15
2 4 DEMOD PWB ASS'Y PU21345E-2
R815 CH-1 LEVEL
R823 CH-2 DEEMPHASIS
R852 SUB(R) OUT LEVEL
R853 MAIN(L) OUT LEVEL
R836 SEPARATION
R838 PILOT CARR LEVEL
CH-1 LEVEL
CH-2 DEEMPHASIS
R OUT LEVEL
L OUT LEVEL
SEPA RATI ON
PILOT CARR LEVEL
CN3
CN6
CN4
CN7
CN2
IC801
IC802
IC803
IC804
IC805
IC806
IC807
IC808
T801
T802
T803
T804
SAW801
TP801
TP803
TP804
TP805
TP806
TP807
TP808
TP809
TP811
TP812
TP813
TP815
TP816
TP817
TP818
TP819
TP821
Q801
Q802
Q803
Q804
S75-94V-0

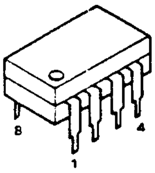
LA7506



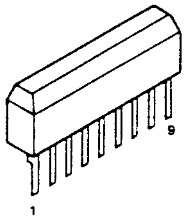
UPC1391H



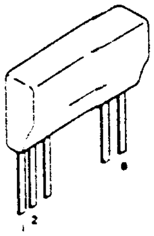
UPC4558C



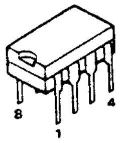
TA7324P



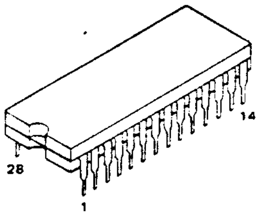
PU52779



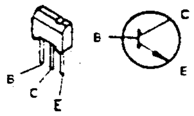
UPC358C



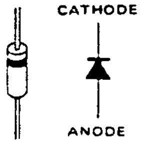
LA7751



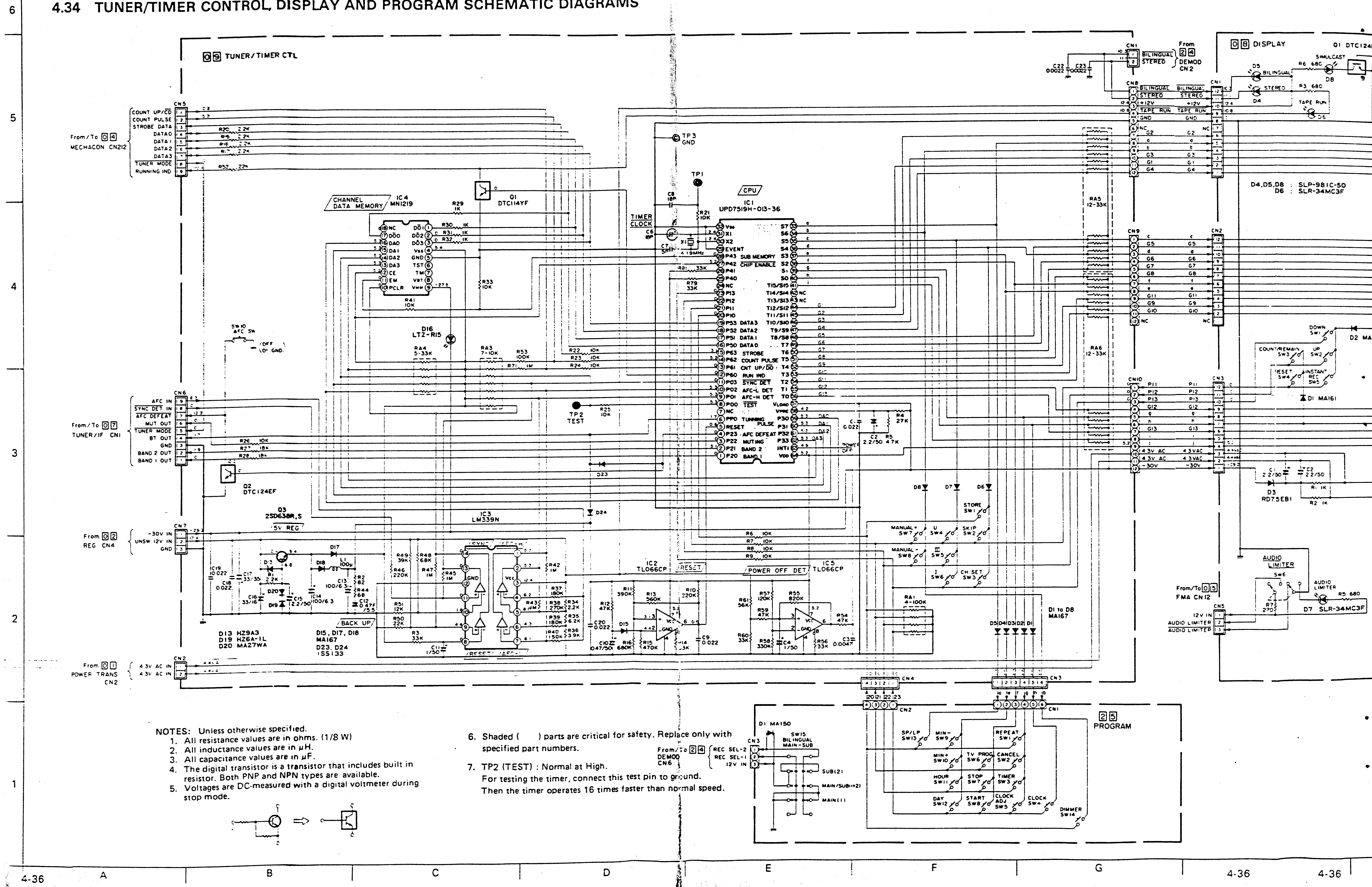
2SD636



MA150
1SS133


CATHODE
ANODE

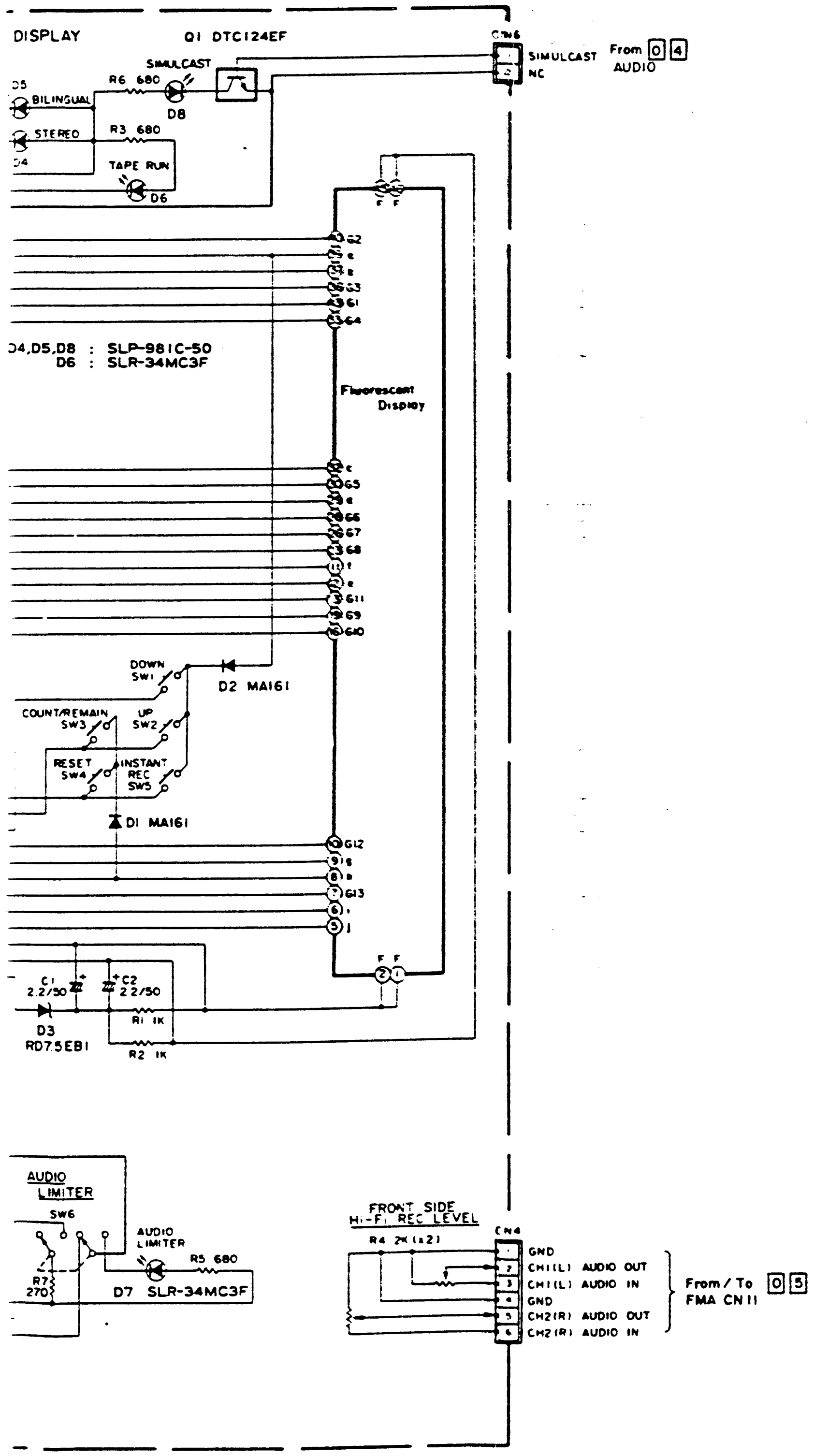
4.34 TUNER/TIMER CONTROL, DISPLAY AND PROGRAM SCHEMATIC DIAGRAMS

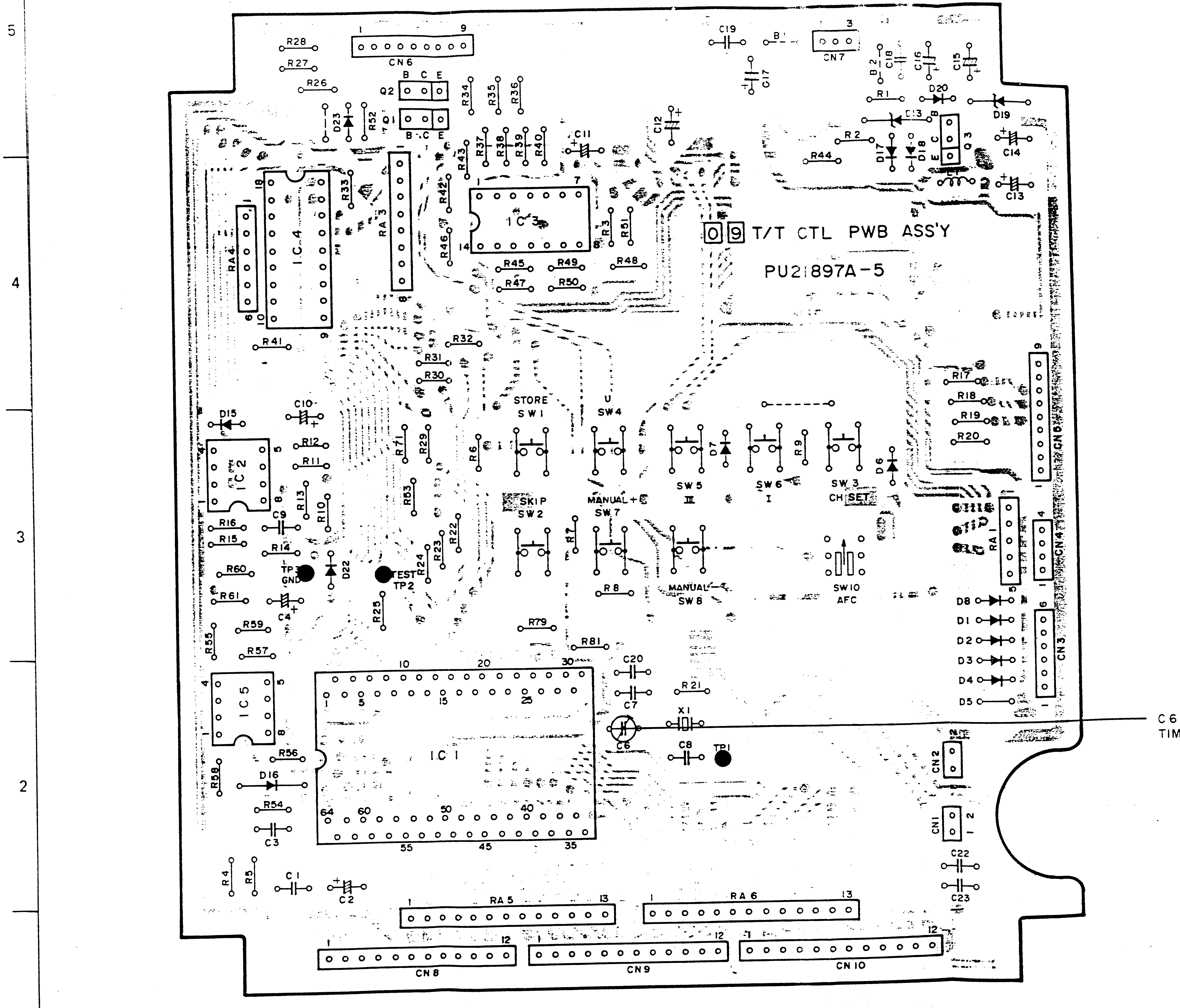

09 TUNER/TIMER CTL
08 DISPLAY
25 PROGRAM
From/To 04 MECHACON CN212
COUNT UP/CD
COUNT PULSE
STROBE DATA
DATA0
DATA1
DATA2
DATA3
TUNER MODE
RUNNING IND
From/To 07 TUNER/IF CN1
AFC IN
SYNC DET IN
AFC DEFEAT
MUT OUT
TUNER MODE
BT OUT
GND
BAND 2 OUT
BAND 1 OUT
From 02 REG CN4
-30V IN
UNSW 12V IN
GND
From 01 POWER TRANS CN2
4.3V AC IN
CHANNEL DATA MEMORY
IC4 MN1219
Q1 DTC114YF
Q2 DTC124EF
Q3 2SD638R,S
5V REG
IC3 LM339N
SYNC
AFC-H
RESET
AFC-L
BACK UP
D16 LTZ-R15
SW10 AFC SW
TP1
TP2 TEST
TP3 GND
CPU
IC1 UPD7519H-013-36
TIMER CLOCK
X1 4.19MHz
SUB MEMORY
CHIP ENABLE
IC2 TL066CP
RESET
IC5 TL066CP
POWER OFF DET
D13 HZ9A3
D19 HZ6A-1L
D20 MA27WA
D15, D17, D18 MA167
D23, D24 1SS133
D1 to D8 MA167
RA5 12-33K
RA6 12-33K
RA1 4-100K
From 24 DEMOD CN2
BILINGUAL
STEREO
+12V
TAPE RUN
GND
D4,D5,D8 : SLP-981C-50
D6 : SLR-34MC3F
Q1 DTC124
SIMULCAST
D2 MA
D1 MA161
D3 RD7.5EB1
AUDIO LIMITER
From/To 05 FMA CN12
12V IN
AUDIO LIMITER
D7 SLR-34MC3F
STORE SW1
MANUAL+ SW7
SKIP SW2
MANUAL- SW8
CH SET SW3
DOWN SW1
COUNT/REMAIN SW3
UP SW2
RESET SW4
INSTANT REC SW5
D1 MA150
SW15 BILINGUAL MAIN-SUB
From/To 24 DEMOD CN6
REC SEL-2
REC SEL-1
12V IN
SUB(2)
MAIN/SUB(1+2)
MAIN(1)
SP/LP SW13
MIN- SW9
REPEAT SW1
MIN+ SW10
TV PROG SW6
CANCEL SW2
HOUR SW11
STOP SW7
TIMER SW3
DAY SW12
START SW8
CLOCK ADJ SW5
CLOCK SW4
DIMMER SW14
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
6
5
4
3
2
1
A
B
C
D
E
F
G

NOTES: Unless otherwise specified.

1. All resistance values are in ohms. (1/8 W)
2. All inductance values are in μH.
3. All capacitance values are in μF.
4. The digital transistor is a transistor that includes built in resistor. Both PNP and NPN types are available.
5. Voltages are DC-measured with a digital voltmeter during stop mode.
6. Shaded ( ) parts are critical for safety. Replace only with specified part numbers.
7. TP2 (TEST) : Normal at High. For testing the timer, connect this test pin to ground. Then the timer operates 16 times faster than normal speed.

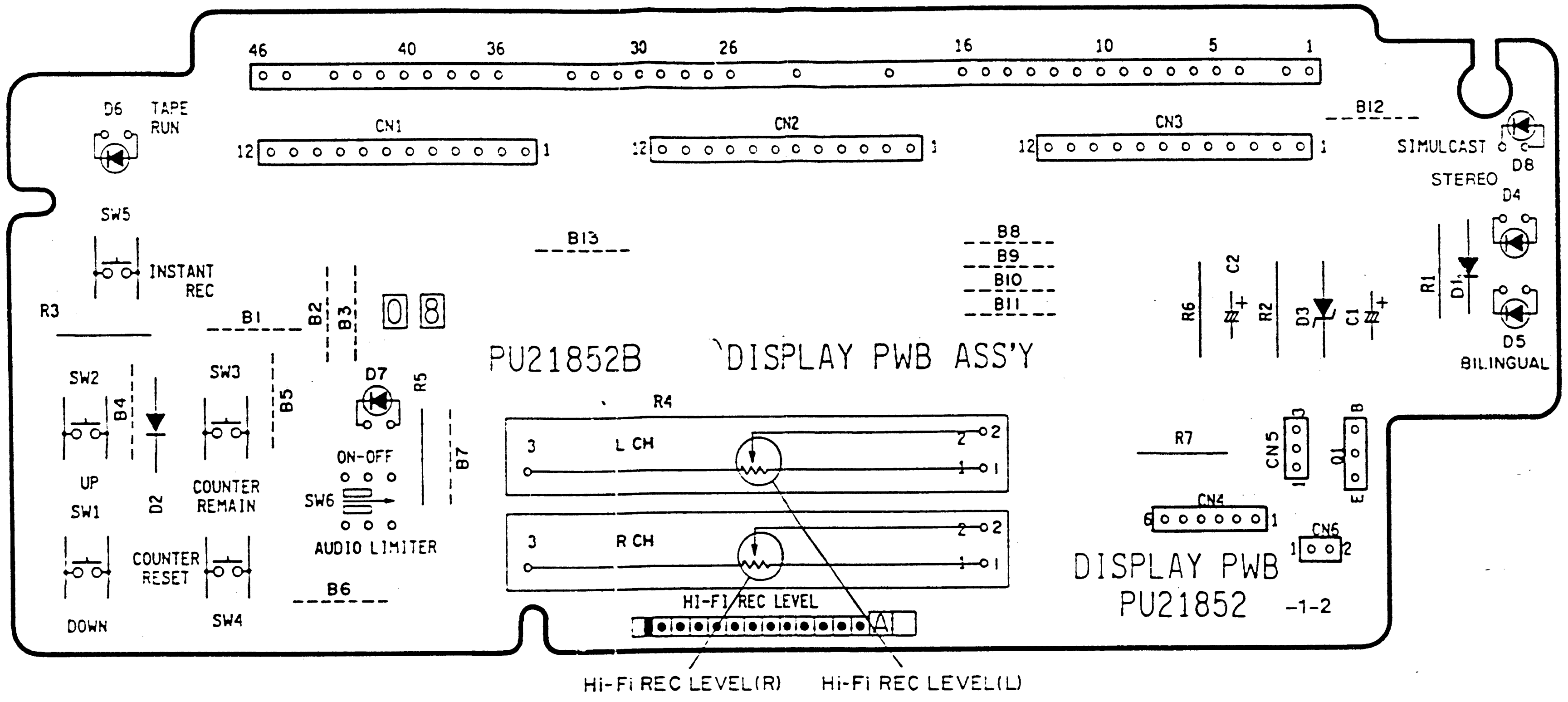
CTL TUNER/TIMER CTL


DISPLAY
Q1 DTC124EF
SIMULCAST
R6 680
D5
BILINGUAL
D8
STEREO
R3 680
D4
TAPE RUN
D6
CN6
SIMULCAST
NC
From 0 4
AUDIO
F F
G2
e
e
G3
G1
G4
D4,D5,D8 : SLP-981C-50
D6 : SLR-34MC3F
Fluorescent Display
c
G5
e
G6
G7
G8
f
e
G11
G9
G10
DOWN SW1
D2 MA161
COUNT/REMAIN SW3
UP SW2
RESET SW4
INSTANT REC SW5
D1 MA161
G12
g
a
G13
i
j
F F
C1 2.2/50
C2 2.2/50
R1 1K
D3 RD7.5EB1
R2 1K
AUDIO LIMITER
SW6
AUDIO LIMITER
R5 680
R7 270
D7 SLR-34MC3F
FRONT SIDE Hi-Fi REC LEVEL
R4 2K (x2)
CN4
GND
CH1(L) AUDIO OUT
CH1(L) AUDIO IN
GND
CH2(R) AUDIO OUT
CH2(R) AUDIO IN
From / To 0 5
FMA CN11

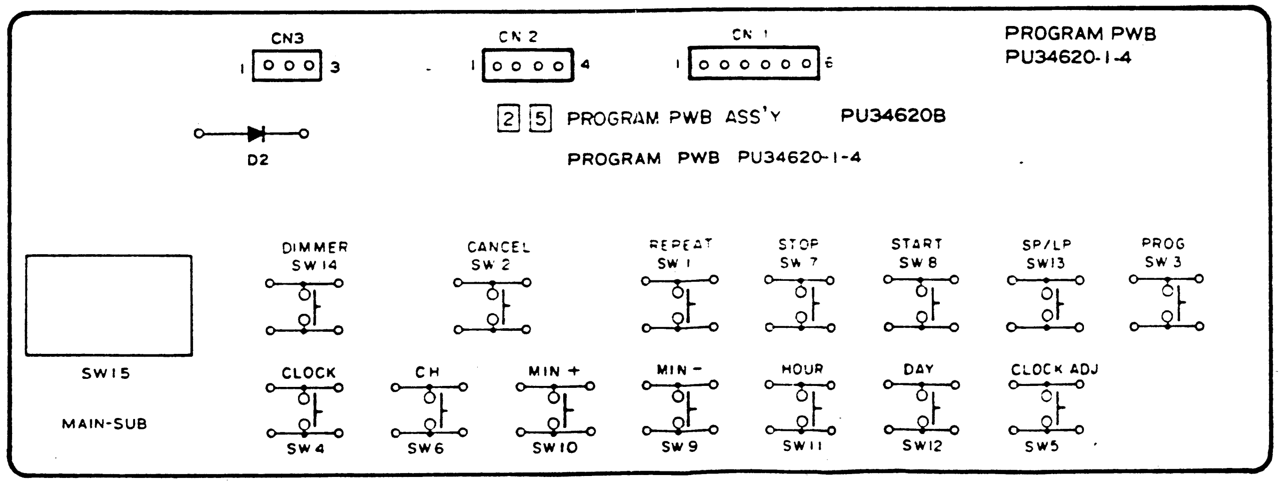


09 T/T CTL PWB ASS'Y
PU21897A-5
5
4
3
2
C6
TIM
IC1
IC2
IC3
IC4
IC5
RA1
RA3
RA4
RA5
RA6
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
Q1
Q2
Q3
X1
L1
STORE SW1
SKIP SW2
SW3 CH SET
SW4
SW5 III
SW6 I
MANUAL + SW7
MANUAL - SW8
SW10 AFC
TP1
TEST TP2
TP3 GND

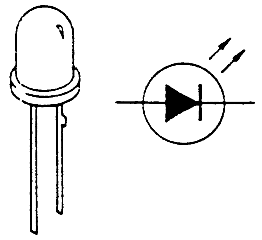
– DISPLAY –


46
40
36
30
26
16
10
5
1
D6
TAPE RUN
CN1
CN2
CN3
B12
SIMULCAST
D8
STEREO
D4
SW5
INSTANT REC
B13
B8
B9
B10
B11
R6
C2
R2
D3
C1
R1
D1
D5
BILINGUAL
R3
B1
B2
B3
PU21852B
DISPLAY PWB ASS'Y
SW2
B4
SW3
B5
D7
R5
R4
UP
SW1
D2
COUNTER REMAIN
ON-OFF
SW6
B7
L CH
R CH
R7
CN5
Q1
CN4
CN6
AUDIO LIMITER
COUNTER RESET
B6
DOWN
SW4
HI-FI REC LEVEL
DISPLAY PWB
PU21852 -1-2
Hi-Fi REC LEVEL(R)
Hi-Fi REC LEVEL(L)

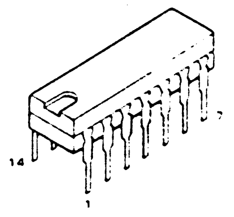
– PROGRAM –


CN3
CN 2
CN 1
PROGRAM PWB
PU34620-1-4
D2
2 5 PROGRAM PWB ASS'Y PU34620B
PROGRAM PWB PU34620-1-4
DIMMER SW14
CANCEL SW 2
REPEAT SW 1
STOP SW 7
START SW 8
SP/LP SW13
PROG SW 3
SW15
MAIN-SUB
CLOCK SW4
CH SW6
MIN + SW10
MIN – SW9
HOUR SW11
DAY SW12
CLOCK ADJ SW5

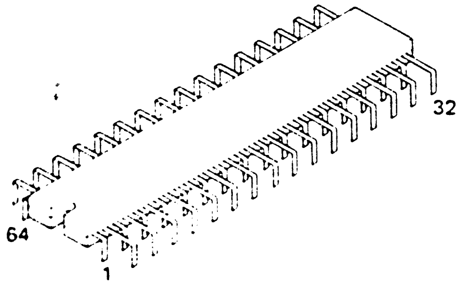
SLR-34MC3F
SLP-981C-50



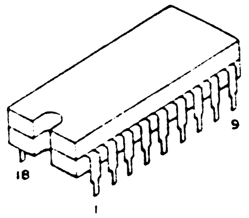
LM339N



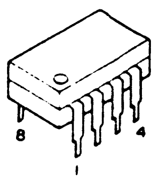
UPD7519H-013-36



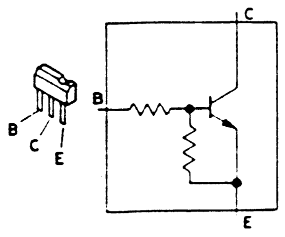
MN1219



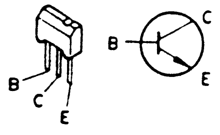
TL066CP



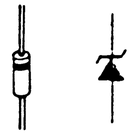
DTC124F
DTC114YF



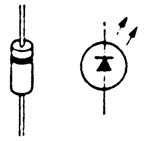
2SD638



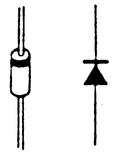
RD7.5EB1
HZ6A-1L
HZ9A3



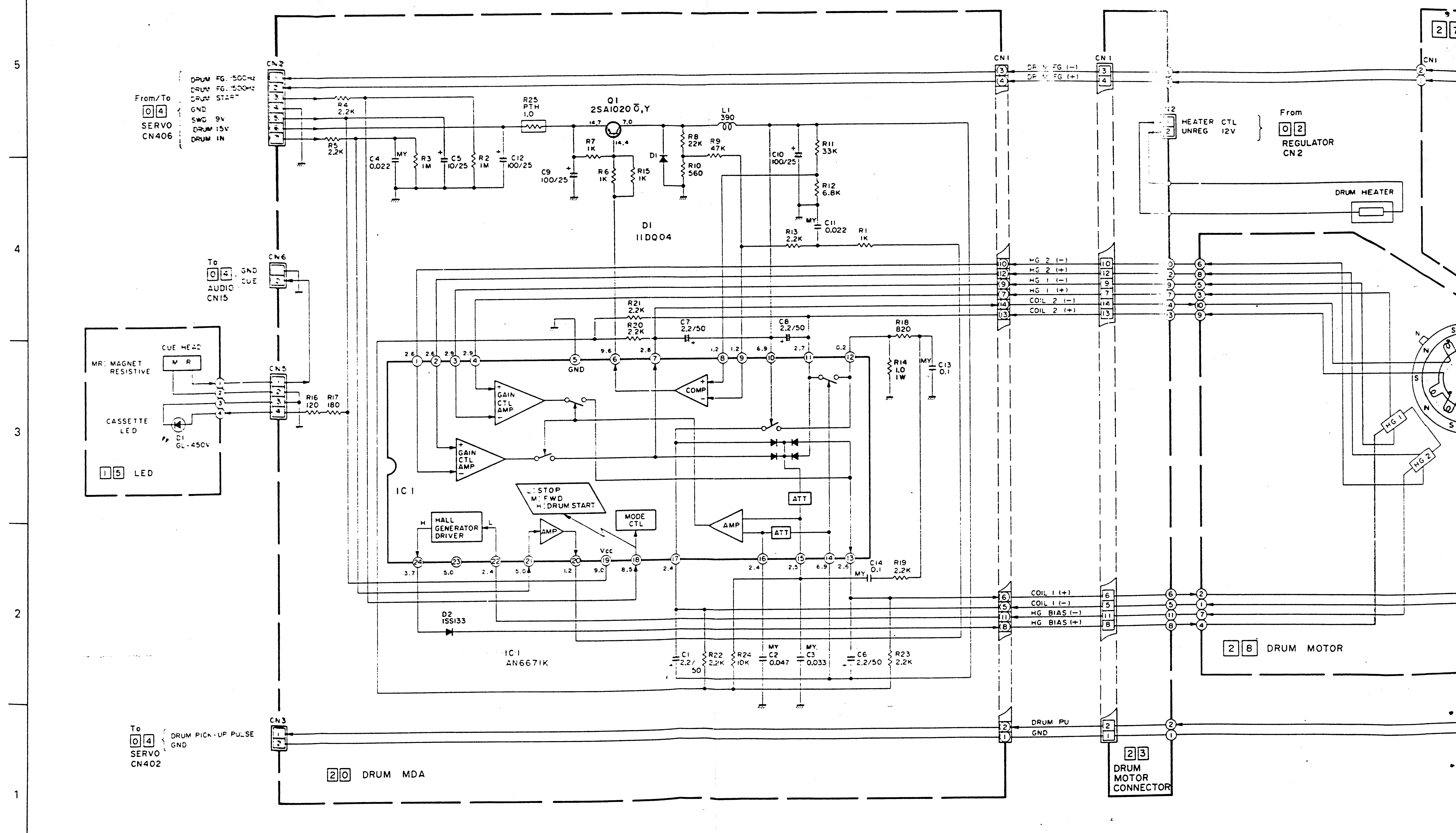
LTZ-R15



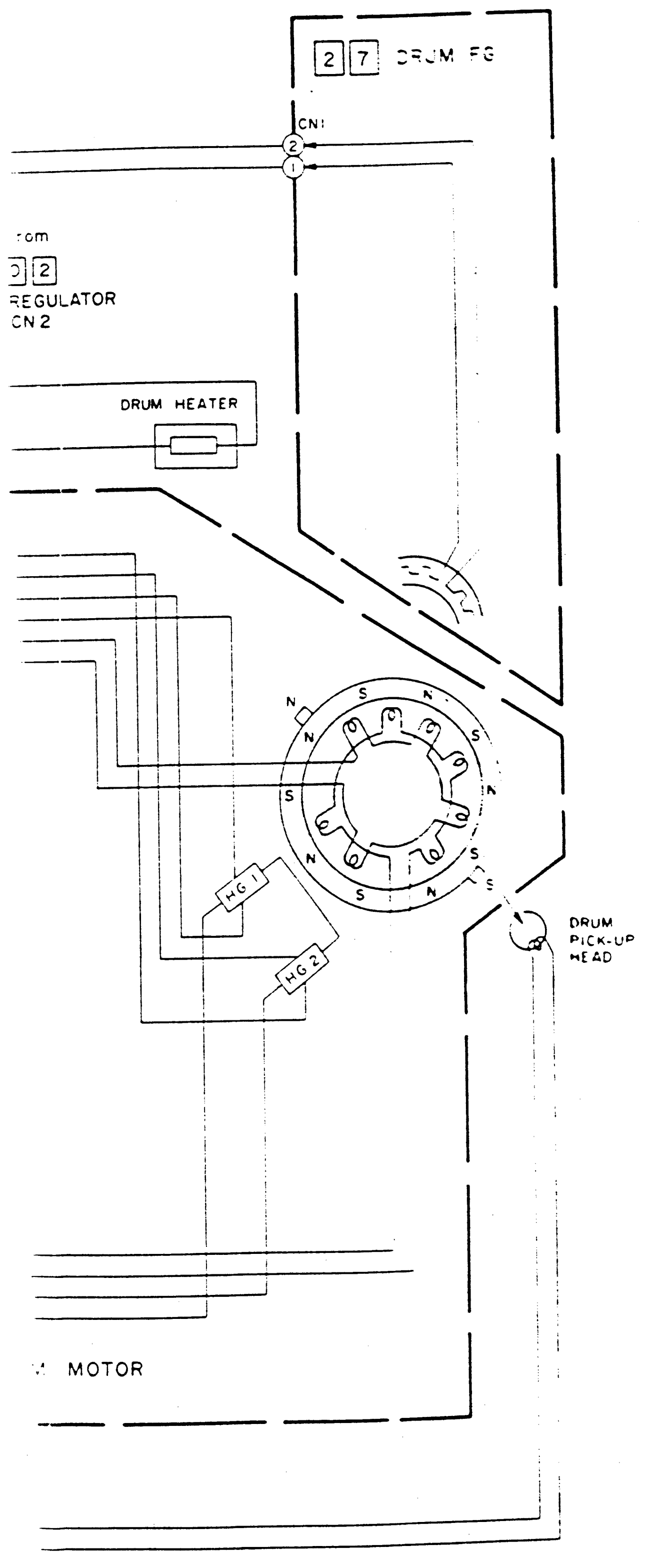
MA150
MA161
1SS133
MA167
MA27WA



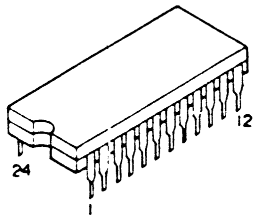
4.36 DRUM MDA, DRUM MOTOR CONNECTOR, DRUM MOTOR AND DRUM FG SCHEMATIC DIAGRAMS SCHEMATIC DIAGRAMS


6
5
4
3
2
1
From/To
0 4
SERVO
CN406
DRUM FG. 1500Hz
DRUM FG. 1500Hz
DRUM START
GND
SWD 9V
DRUM 15V
DRUM IN
CN2
R4 2.2K
R5 2.2K
C4 0.022
MY
R3 1M
C5 10/25
R2 1M
C12 100/25
R25 PTH 1.0
Q1 2SA1020 O,Y
14.7
7.0
14.4
R7 1K
C9 100/25
R6 1K
R15 1K
D1
R8 22K
R9 47K
R10 560
L1 390
C10 100/25
R11 33K
R12 6.8K
MY
C11 0.022
R13 2.2K
R1 1K
D1 11DQ04
To
0 4
AUDIO
CN15
GND
CUE
CN6
MR: MAGNET RESISTIVE
CUE HEAD
M R
CASSETTE LED
D1 GL-450V
1 5 LED
CN5
R16 120
R17 180
R21 2.2K
R20 2.2K
C7 2.2/50
C8 2.2/50
R18 820
R14 1.0 1W
MY
C13 0.1
2.6 2.6 2.9 2.9
GND
9.6
2.8
1.2 1.2
6.9
2.7
0.2
GAIN CTL AMP
COMP
GAIN CTL AMP
IC 1
L: STOP
M: FWD
H: DRUM START
MODE CTL
ATT
AMP
ATT
HALL GENERATOR DRIVER
H
L
AMP
Vcc
3.7 5.0 2.4 5.0 1.2 9.0 8.5 2.4 2.4 2.5 6.9 2.6
C14 0.1
MY
R19 2.2K
D2 1SS133
IC1 AN6671K
C1 2.2/50
R22 2.2K
R24 10K
MY C2 0.047
MY C3 0.033
C6 2.2/50
R23 2.2K
To
0 4
SERVO
CN402
DRUM PICK-UP PULSE
GND
CN3
2 0 DRUM MDA
CN1
DRUM FG (−)
DRUM FG (+)
HG 2 (−)
HG 2 (+)
HG 1 (−)
HG 1 (+)
COIL 2 (−)
COIL 2 (+)
COIL 1 (+)
COIL 1 (−)
HG BIAS (−)
HG BIAS (+)
DRUM PU
GND
CN1
2 3
DRUM MOTOR CONNECTOR
CN2
HEATER CTL
UNREG 12V
From
0 2
REGULATOR
CN2
DRUM HEATER
2 8 DRUM MOTOR
CN1
N
S
HG 1
HG 2
2 7

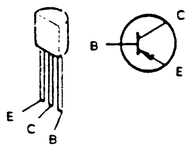
A B C D E F G


27 DRUM FG
CN1
2
1
rom
2
REGULATOR
CN2
DRUM HEATER
N
S
HG1
HG2
DRUM PICK-UP HEAD
MOTOR

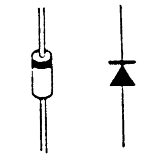
AN6671K



2SA1020



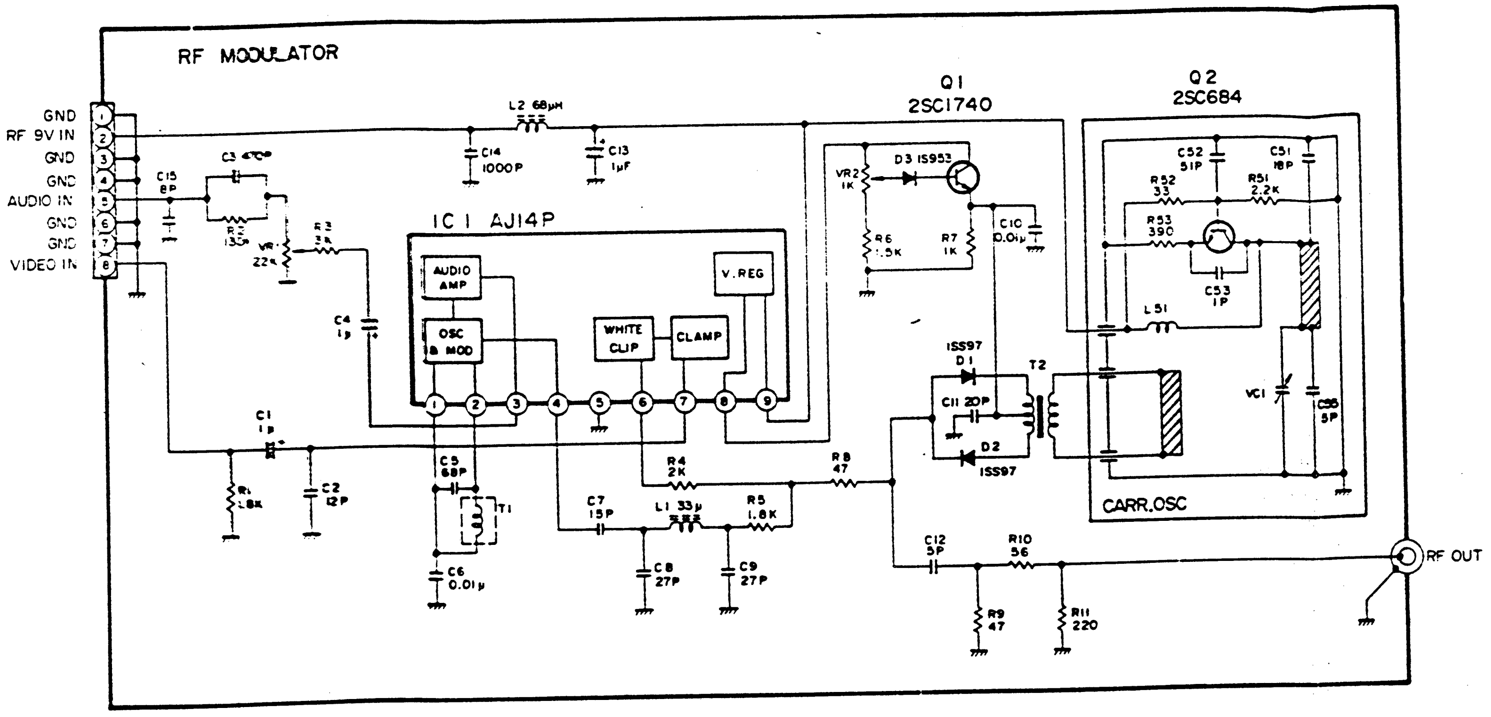
11DQ04
1SS133



NOTES: Unless otherwise specified,

1. All resistance values are in ohms. (1/6 W)
2. All inductance values are in μH.
3. All capacitance values are in μF.
4. Voltages are DC-measured with a digital voltmeter during recording (SP mode).
5. Shaded ( ) parts are critical for safety. Replace only with specified part numbers.

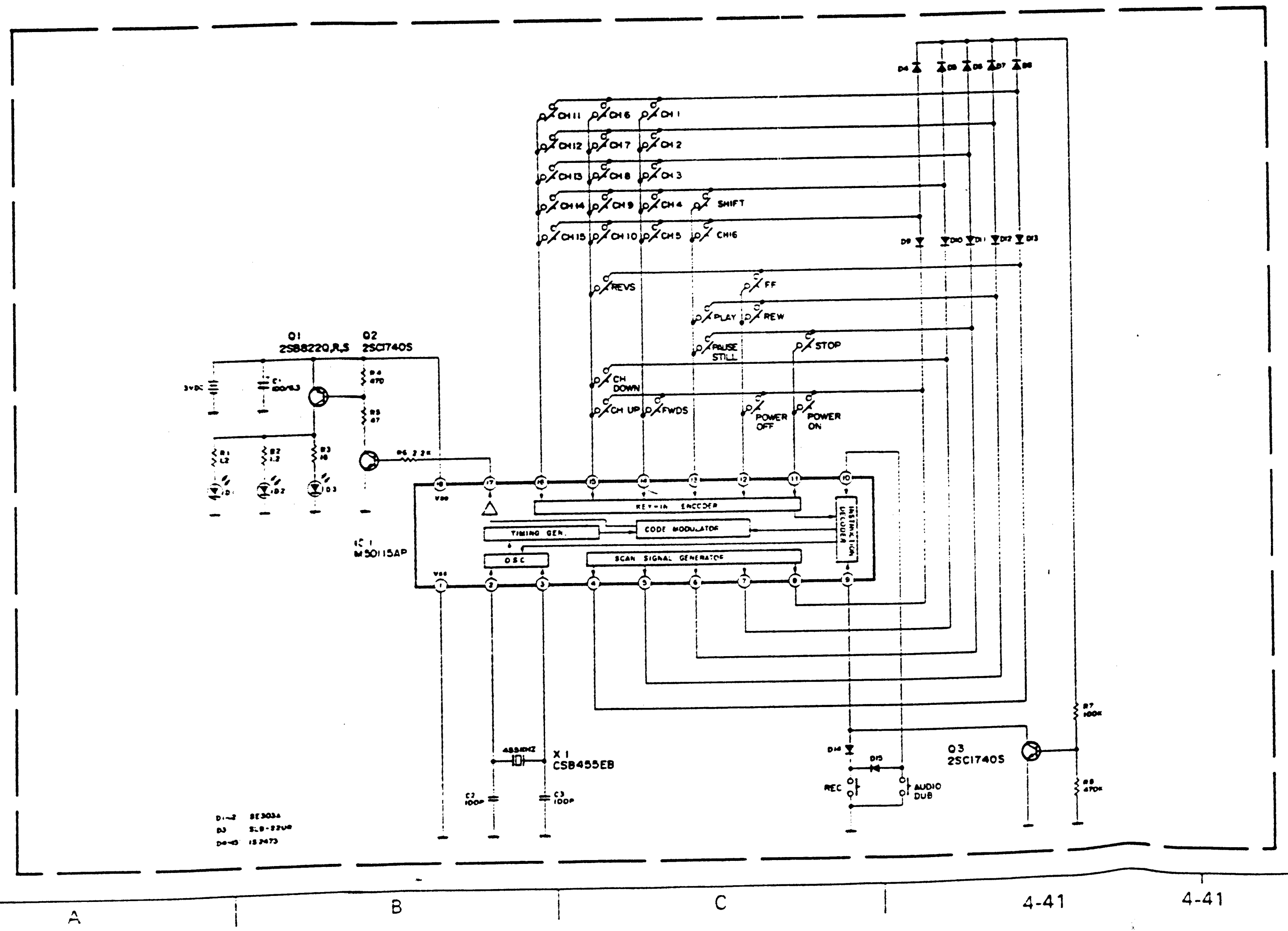
4.39 RF MODULATOR SCHEMATIC DIAGRAM


RF MODULATOR
GND
RF 9V IN
GND
GND
AUDIO IN
GND
GND
VIDEO IN
C15 8P
C3 470P
R2 130
VR1 22K
R3 3K
C4 1μ
L2 68μH
C14 1000P
C13 1μF
IC1 AJ14P
AUDIO AMP
OSC & MOD
WHITE CLIP
CLAMP
V.REG
C1 1μ
R1 1.8K
C2 12P
C5 68P
T1
C6 0.01μ
C7 15P
L1 33μ
C8 27P
C9 27P
R4 2K
R5 1.8K
R8 47
Q1 2SC1740
VR2 1K
D3 1S953
R6 1.5K
R7 1K
C10 0.01μ
1SS97 D1
C11 20P
T2
D2 1SS97
C12 5P
R10 56
R9 47
R11 220
Q2 2SC684
C52 51P
C51 18P
R52 33
R51 2.2K
R53 390
C53 1P
L51
VC1
C55 5P
CARR.OSC
RF OUT

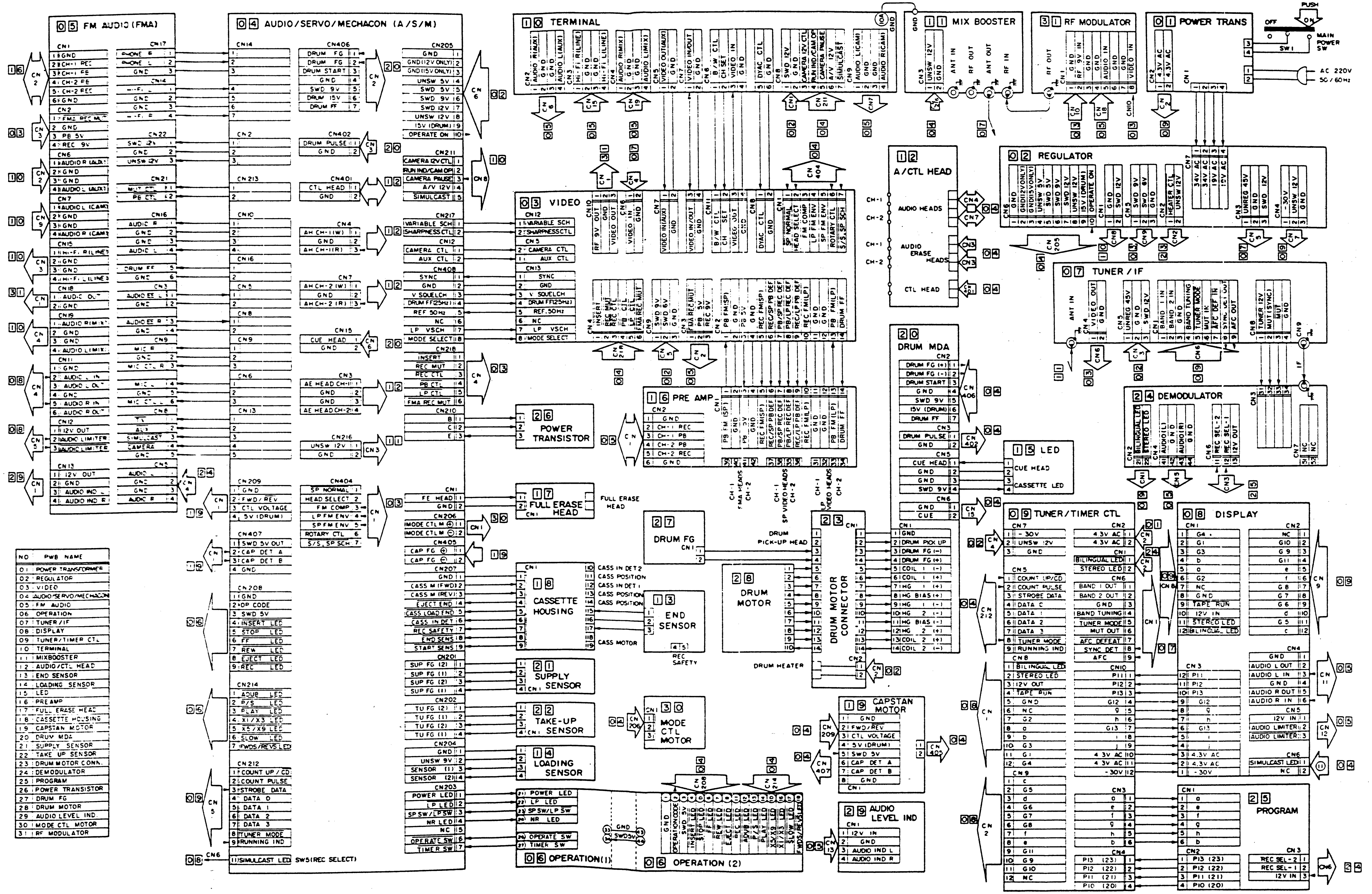
NOTES: Unless otherwise specified,

1. All resistance values are in ohms.
2. All capacitance values are in F.
3. All inductance values are H.

4.40 REMOTE CONTROLLER SCHEMATIC DIAGRAM


D4 D5 D6 D7 D8
CH11 CH6 CH1
CH12 CH7 CH2
CH13 CH8 CH3
CH14 CH9 CH4 SHIFT
CH15 CH10 CH5 CH16
D9 D10 D11 D12 D13
REVS
FF
PLAY
REW
PAUSE STILL
STOP
CH DOWN
CH UP
FWDS
POWER OFF
POWER ON
Q1 2SB822Q,R,S
Q2 2SC1740S
3VDC
C1 100/6.3
R4 470
R5 47
R1 1.2
R2 1.2
R3 10
R6 2.2K
D1 D2 D3
IC1 M50115AP
VDD
VSS
KEY-IN ENCODER
TIMING GEN.
CODE MODULATOR
OSC
SCAN SIGNAL GENERATOR
INSTRUCTION DECODER
455KHZ
X1 CSB455EB
C2 100P
C3 100P
D14
D15
REC
AUDIO DUB
Q3 2SC1740S
R7 100K
R8 470K
D1~2 SE303A
D3 SLB-22UR
D4~15 1S2473

4.41 BOARD INTERCONNECTION

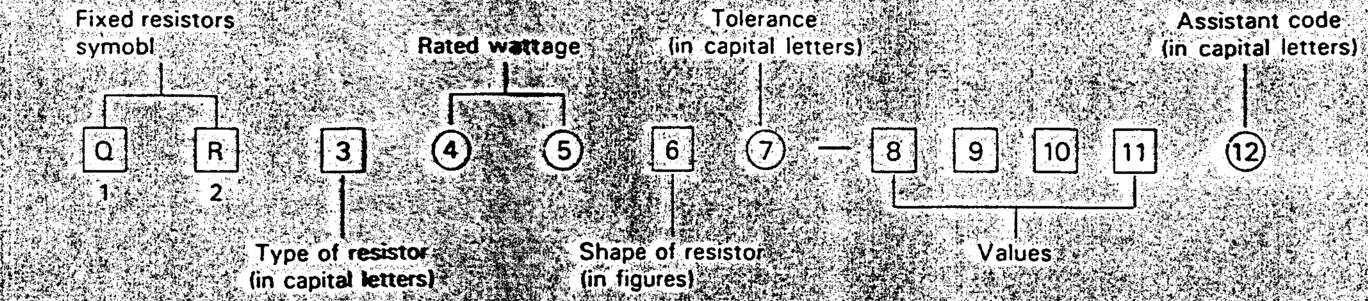

05 FM AUDIO (FMA)
04 AUDIO/SERVO/MECHACON (A/S/M)
10 TERMINAL
11 MIX BOOSTER
31 RF MODULATOR
01 POWER TRANS
MAIN POWER SW
AC 220V 50/60Hz
PUSH
OFF
ON
SW1
12 A/CTL HEAD
AUDIO HEADS
AUDIO ERASE HEADS
CTL HEAD
02 REGULATOR
03 VIDEO
07 TUNER / IF
20 DRUM MDA
26 POWER TRANSISTOR
16 PRE AMP
15 LED
CUE HEAD
CASSETTE LED
17 FULL ERASE HEAD
27 DRUM FG
DRUM PICK-UP HEAD
28 DRUM MOTOR
23 DRUM MOTOR CONNECTOR
DRUM HEATER
18 CASSETTE HOUSING
13 END SENSOR
REC SAFETY
CASS MOTOR
21 SUPPLY SENSOR
22 TAKE-UP SENSOR
30 MODE CTL MOTOR
14 LOADING SENSOR
19 CAPSTAN MOTOR
29 AUDIO LEVEL IND
06 OPERATION (1)
06 OPERATION (2)
09 TUNER/TIMER CTL
24 DEMODULATOR
08 DISPLAY
25 PROGRAM
SW5(REC SELECT)

NO	PWB NAME
01	POWER TRANSFORMER
02	REGULATOR
03	VIDEO
04	AUDIO/SERVO/MECHACON
05	FM AUDIO
06	OPERATION
07	TUNER/IF
08	DISPLAY
09	TUNER/TIMER CTL
10	TERMINAL
11	MIXBOOSTER
12	AUDIO/CTL HEAD
13	END SENSOR
14	LOADING SENSOR
15	LED
16	PREAMP
17	FULL ERASE HEAD
18	CASSETTE HOUSING
19	CAPSTAN MOTOR
20	DRUM MDA
21	SUPPLY SENSOR
22	TAKE UP SENSOR
23	DRUM MOTOR CONN.
24	DEMODULATOR
25	PROGRAM
26	POWER TRANSISTOR
27	DRUM FG
28	DRUM MOTOR
29	AUDIO LEVEL IND.
30	MODE CTL MOTOR
31	RF MODULATOR

SECTION 5
STANDARD PART NUMBER CODING

5.1 FIXED RESISTOR CODING

Fixed resistor part numbers are as follows.


Fixed resistors
symobl
Rated wattage
Tolerance
(in capital letters)
Assistant code
(in capital letters)
Q
R
3
④
⑤
6
⑦
—
8
9
10
11
⑫
1
2
Type of resistor
(in capital letters)
Shape of resistor
(in figures)
Values

Type of resistor (third digit)

C	Composition resistors
D	Carbon film resistors
F	Unflammable resistors
G	Oxide metal film resistors
H	Fusible resistors
M	Metal plate resistors
S	Metal glazed resistors
V	Precision metal film resistors
W	Wire wound resistors
X	Metal film resistors
Z	Special resistors

Rated wattage
(fourth and fifth digits)

A0	1/10 W
18	1/8 W
16	1/6 W
14	1/4 W
12	1/2 W
01	1 W
02	2 W
03	3 W
04	4 W
05	5 W
06	6 W
07	7 W
75	7.5 W
08	8 W
10	10 W
15	15 W
A6	16 W
20	20 W
30	30 W

Tolerance
(seventh digit)

F	±1 %
G	±2 %
J	±5 %
K	±10 %
M	±20 %

Values
(eighth — tenth or eleventh digits)
examples:

R47		0.47 Ω
4R7		4.7 Ω
470	47×10^0	47 Ω
471	47×10^1	470 Ω
472	47×10^2	4.7 kΩ
473	47×10^3	47 kΩ
474	47×10^4	470 kΩ
475	47×10^5	4.7 MΩ

QRV resistance shown by four digits:

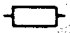
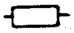
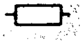
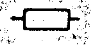
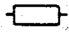
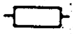
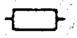
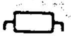
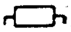
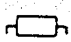
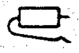
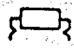
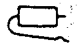
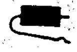
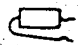
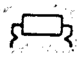
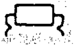
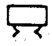
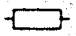
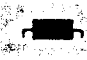
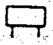
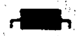
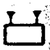
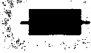
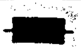
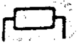
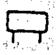
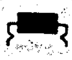
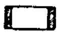
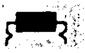
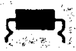
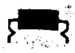
4640	464×10^0	464 Ω
4641	464×10^1	4.64 kΩ
4642	464×10^2	46.4 kΩ

Assistant code
(twelfth digit)

A	Small type
B	Small type
S	Small type
Y	Lead taping
Z	Lead taping

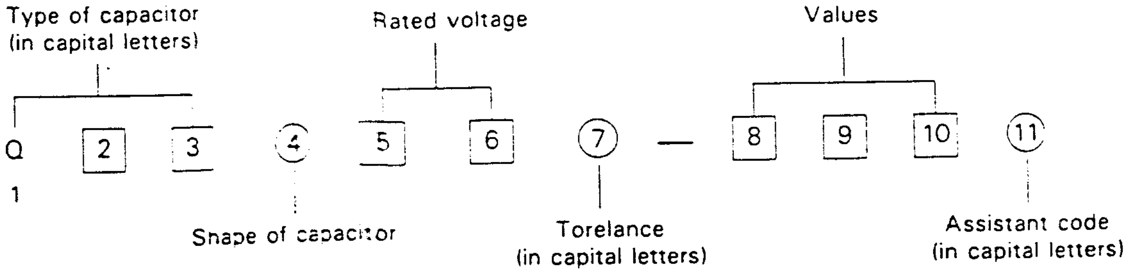
Shape of resistor (sixth digit)

Note: ■ marks are flame retardant resistor.

Type of resistor Shape of resistor	C	D	F	G	H	M	S	V	W	X
1										
2										
3										
4										
5									(L) type	
6										
7			Lug (B) type							
8			Lug (A) type				 Chip			
9			Lug (C) type							

5.2 FIXED CAPACITOR CODING

Fixed capacitor part numbers are as follows.


Type of capacitor
(in capital letters)
Rated voltage
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Shape of capacitor
Torelance
(in capital letters)
Assistant code
(in capital letters)

Ceramic capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Mono-direction	Kink lead	Axial lead	Axial forming lead	Chip
QCC	Ceramic	1		4	5	
QCD	High capacitance					A
QCF	High capacitance	1,4	3			8,A
QCS	Temperature compensation	1	3	4	5	8,A
QCT	Temperature compensation	Special coding				8,A
QCV	Ceramic			1	3	
QCX	Ceramic			1	3	
QCY	High capacitance	1,4	3	6	7	8,A
QCZ	Special type	Special coding				

Electrolytic capacitors

Type of capacitor (first-third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Tubular	Mono-direction	Anti-stress	Forming	Snap-in
QEB	Low leakage		4	5	6	
QEC	Low leakage		4,8,A	9,B	6,C	
QEE	Tantalum (normal)		4	5	6	
	Tantalum (small)		8			
QEF	Chip tantalum	8 (chip type)				
QEG	Low impedance		4			
QEK	Miniature type		4	5	6	
QEL	Small type		4	5	6	7
QEM	Small type		4	5	6	
QEN	Non-polar	2	4	5	6	
QEP	Non-polar (small)		4,A	5,B	6,C	
QER	Miniature type		4	5	6	
QET	Small type	2	4	5,B	6,C	7
QEU	Small type		4	5	6	
QEV	Small type		4		6	7
QEW	Normal	2	4	5	6	7

Paper film capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)				
		Tubular	Normal		Flame retardant	
Symbol	Characteristics		Mono-direction	Kink lead	Mono-direction	Kink lead
QFA	Metalized polypropylene				7	
QFE	Metalized mylar				5	
QFF	Film mica		4			
QFG	Polypropylene film		4	8		
QFH	Metalized mylar	2	4	3	5,7	6
QFJ	Mylar (special)		4			
QFK	Metalized mylar (small)				5	
QFM	Mylar	2	4	3,7	5	6
QFN	Mylar (small)		4	3		
QFP	Polypropylene		4	3,8		
QFS	Polystyrole	2	4	3		
QFV	Thin film		4	8		
QFZ	Special type	Special coding				

Rated voltage (fifth and sixth digits)

Sixth digit / Fifth digit	A	B	C	D	E	F	G	H	J	K	V	W	X
0						3.15	4.0		6.3				
1	10		16	20	25		40	50	63	80	35		
2	100	125	160	200	250	315	400	500	630		350	450	600
3	1000	1250		2000				5000					

Tolerance (seventh digit)

A	$^{+100}_{-10}$ %	M	±20 %
F	±1 %	N	±30 %
G	±2 %	P	$^{+100}_{-0}$ %
H	$^{+50}_{-10}$ %	R	$^{+30}_{-10}$ %
J	±5 %	X	$^{+40}_{-20}$ %
K	±10 %	Z	$^{+80}_{-20}$ %

Values (eighth – tenth digits)

Example : Values are in picofarads

101	10×10^1 pF	100 pF
102	10×10^2 pF	1,000 pF (0.001 μF)
103	10×10^3 pF	10,000 pF (0.01 μF)
104	10×10^4 pF	100,000 pF (0.1 μF)
105	10×10^5 pF	1 μF
5R0		5.0 pF

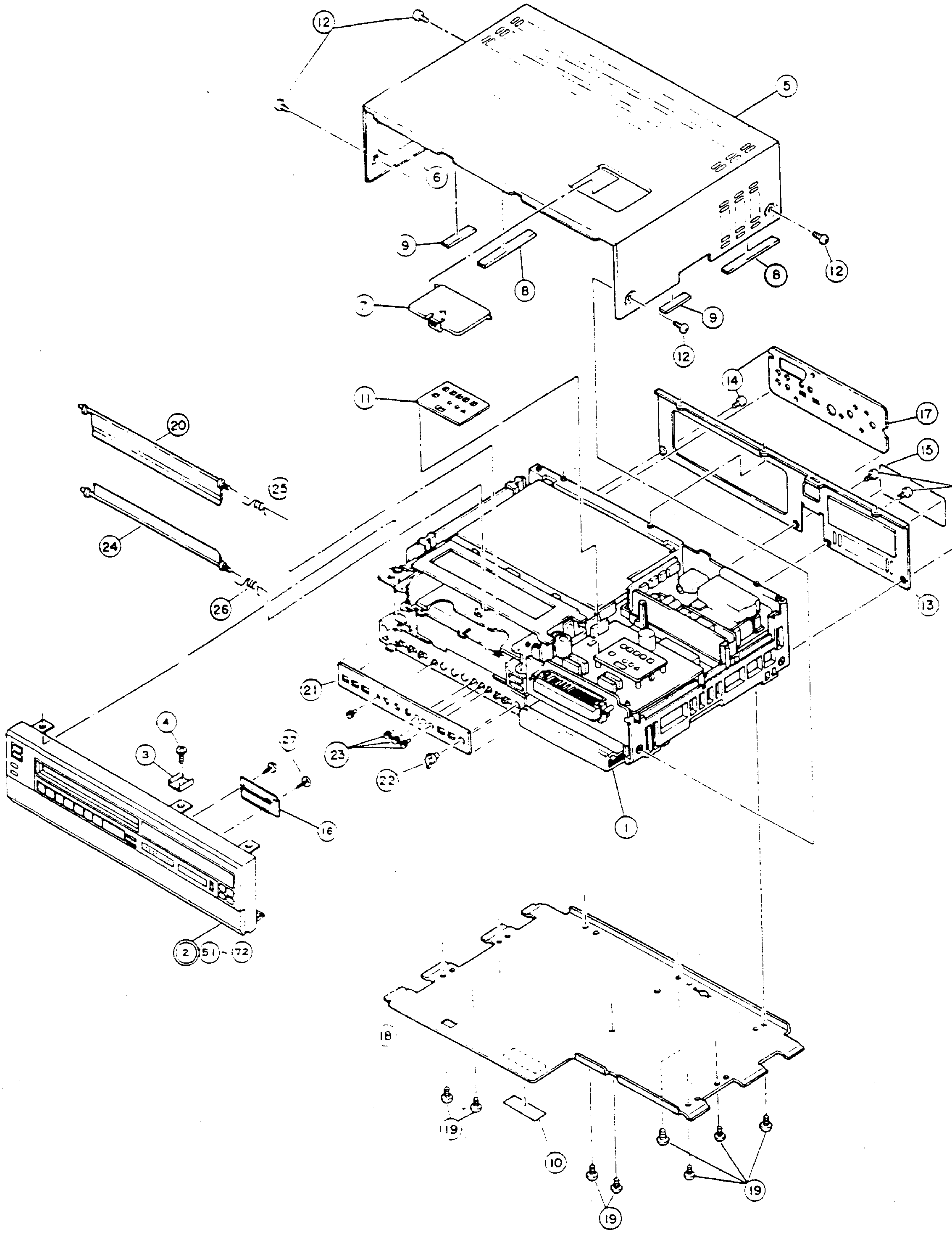
Assistant code (eleventh digit)

G	Small size
Z	Lead taping

SECTION 6
EXPLODED VIEW AND PARTS LIST

ASS'Y No.	ASSEMBLY	Page
M1	CABINET ASSEMBLY	6- 2
M2	CHASSIS ASSEMBLY	6- 4
M3	MECHANISM ASSEMBLY (1)	6- 6
M4	MECHANISM ASSEMBLY (2)	6- 8
M5	CASSETTE HOUSING ASSEMBLY	6-10
M6	PROGRAM ASSEMBLY	6-12
M7	REMOTE CONTROL UNIT	6-14
M8	PACKING ASSEMBLY	6-16
M9	ACCESSORY	6-16

M 1 CABINET ASSEMBLY



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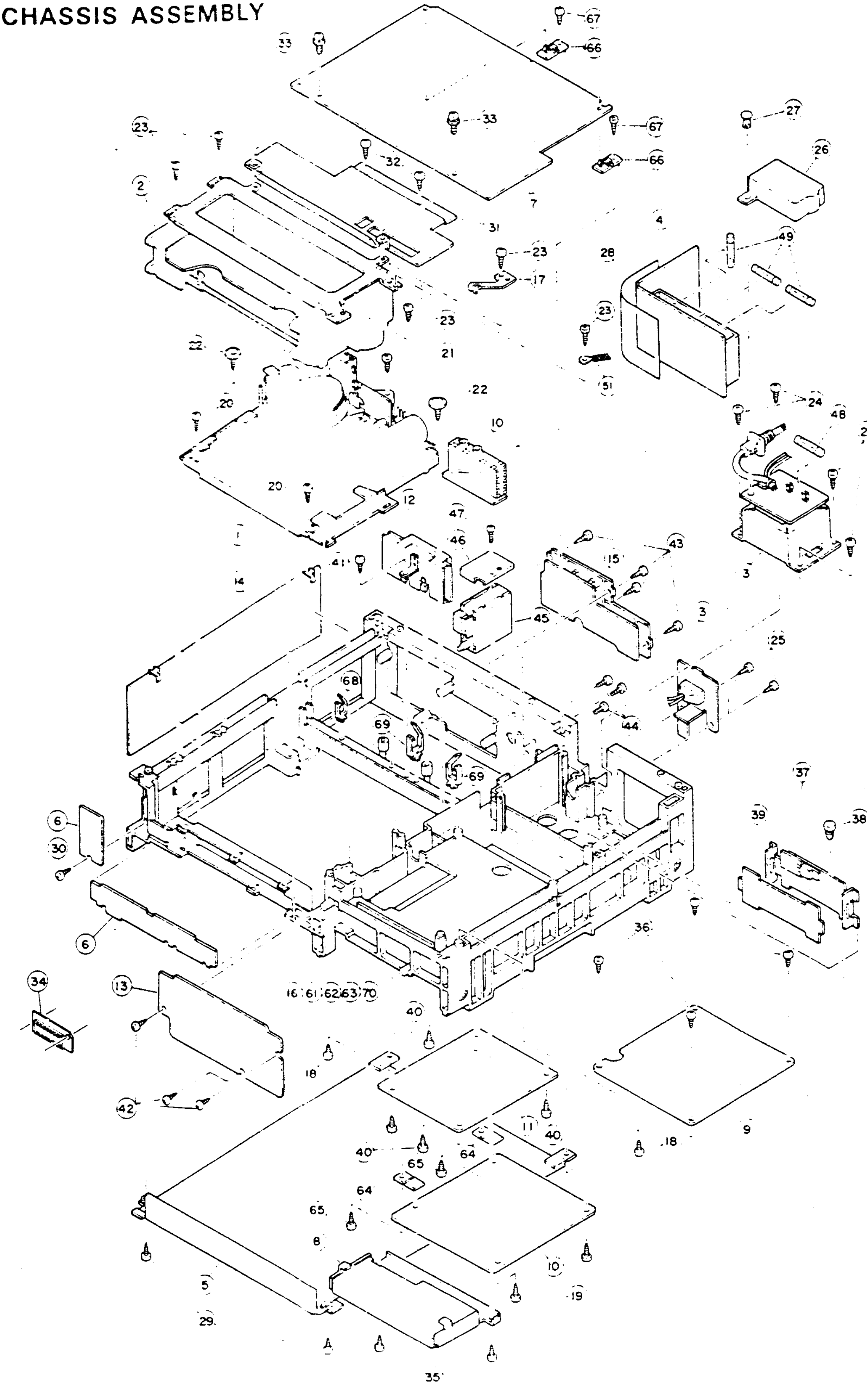
M 1 CABINET ASSEMBLY

Symbol No.	Part No.	Part Name	Description	Q'ty
1	-	Chassis Assembly	REF: M 2	1
⚠ 2	79V29540	Front Panel Assembly	Incl. (51) – (76)	1
3	79V29265	Bracket		1
4	79V29266	Tapping Screw		1
⚠ 5	79V29541	Top Cover		1
6	79V29258	Spacer	Left Side of Top Cover	1
7	79V29542	Channel Cover	Top Cover	1
⚠ 8	79V29263	Edge Cover	Rear Side	2
⚠ 9	79V29264	Edge Cover	Front Side	2
10	79V20787	Label	Dolby	1
11	79V29543	Channel Set Label		1
12	79V29248	Screw	Top Cover	4
⚠ 13	79V29544	Rear Panel		1
14	79V29545	Tapping Screw	Rear Panel	4
⚠ 15	79V29546	Rating Label		1
16	-	-		-
⚠ 17	79V29547	Connector Label		1
⚠ 18	79V29548	Bottom Plate		1
19	79V29251	Tapping Screw	Bottom Plate	8
20	79V29549	Upper Door Assembly	Cassette Housing	1
21	79V29550	Jack Board Label	A/S/M Board	1
22	79V29256	Select Knob	REC SELECT Switch	1
23	79V29551	Volume knob (B)	A/S/M Board	4
24	79V29471	Lower Door	Cassette Housing	1
25	79V23267	Upper Spring	Upper Door Assembly	1
26	79V23304	Lower Spring	Lower Door	1
27	79V29259	Tapping Screw	Audio Level Ind. Ass'y	2
28	-	Audio Level ind. Ass'y	REF: M 2	1
Front Panel Components				
51	79V29552	POWER Button	OPERATE	1
52	79V29268	TIMER Button		1
53	79V29553	REC TIMER Button		1
54	79V29271	Button	EJECT	1
55	79V29269	Operation Button	STOP	1
56	79V29273	Button	REW	1
57	79V29274	Operation Button	PLAY	1
58	79V29275	Operation Button	FF	1
59	79V29276	Operation Button	PAUSE/STILL	1
60	79V29277	Operation Button	REC	1
61	79V29554	SEARCH Button		1
62	79V29278	Push Button	INSERT, AUDIO DUB	2
63	79V29279	AUDIO LIMITER Button		1
64	79V29280	OTR Button	SEGMENT REC	1
65	79V29281	COUNTER REMAIN Button		1
66	79V29282	COUNTER RESET Button		1
67	79V29283	CHANNEL UP Button		1
68	79V29284	CHANNEL DOWN Button		1
69	79V29555	Spring	for (51), (52), (53) and (63)	4
70	79V29286	Spring	for (62)	2
71	79V29556	Spring	for (64)	1
72	79V29557	Spring	for (54), (55), (56), (57), (58), (59), (60), (65), (66), (67) and (68)	11
73	79V29558	Hinge	for (61)	1
74	79V29559	Tapping Screw	for (61)	1
75	79V29560	Spacer	for (51), (52), (53) and (63)	4
76	79V29561	Door Assembly		1

M 2 CHASSIS ASSEMBLY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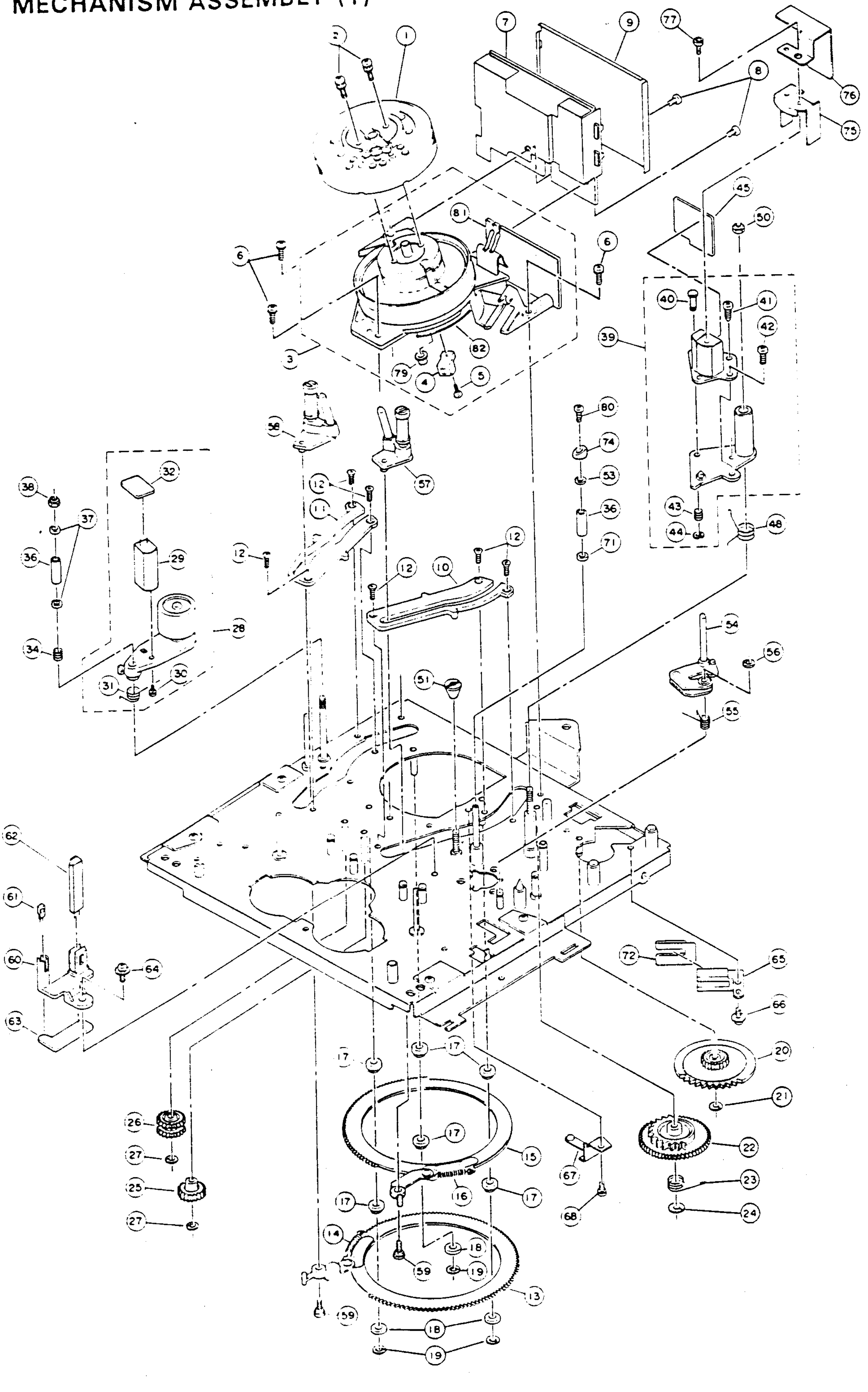
M2 CHASSIS ASSEMBLY

Symbol No.	Part No.	Part Name	Description	Q'ty
1	–	Mechanism Ass'y	REF: M3, M4	1
2	–	Cassette Housing Ass'y	REF: M5	1
3	–	Power Transformer Ass'y	REF: 01	1
4	–	Regulator Board Ass'y	REF: 02	1
5	–	A/S/M Board Ass'y	REF: 04	1
6	–	Operation Board Ass'y	REF: 06	1
7	–	Video Board Ass'y	REF: 03	1
8	–	Program Assembly	REF: M6	1
9	–	T/T CTL Board Ass'y	REF: 09	1
10	–	Tuner/IF Board & Mix Booster Board Ass'y	REF: 07, 11	1
11	–	Demodulator Board Ass'y	REF: 24	1
12	–	Drum MDA Board Ass'y	REF: 20	
13	–	Display Board Ass'y	REF: 08	1
14	–	FMA Board Ass'y	REF: 05	1
15	–	Terminal Board Ass'y	REF: 10	1
⚠ 16	79V29562	Chassis Assembly	Incl. (61) – (70)	1
17	79V29563	Earth Plate	Cassette Housing,Right Side	1
18	79V29251	Tapping Screw	Hinge of A/S/M Board	2
19	79V29108	Tapping Screw	Tuner/IF Board	2
20	79V20878	Tapping Screw	Main-Deck	2
21	79V29564	Special Screw	Main-Deck	1
22	79V29293	Special Screw	Main-Deck	2
23	79V29108	Tapping Screw	Cassette Housing	5
⚠ 24	79V20878	Tapping Screw	Power Transformer	4
25	79V29108	Tapping Screw	Power Bracket	2
⚠ 26	79V29565	AC Cover	Power Transformer	1
27	79V20506	Plastic Rivet	AC Cover	1
28	79V29304	Sheet	for Regulator Board	1
29	79V29251	Tapping Screw	A/S/M Board	2
30	79V29108	Tapping Screw	Operation (1) Board	1
31	79V29566	Shield Cover	on the Main-Deck	1
32	79V29108	Tapping Screw	Shield Cover	2
33	79V23490	Screw	Video Board	2
34	–	Audio Level Ind. Ass'y	REF: 29	1
35	79V29251	Tapping Screw	Program Ass'y	2
36	79V29108	Tapping Screw	T/T CTL Board	4
37	–	Power Transistor Board	REF: 26	1
38	79V29567	Spacer	Power Transistor Board	1
39	79V29305	Spacer	Power Transistor Board	1
40	79V29108	Tapping Screw	Demod. Board	4
41	79V29108	Tapping Screw	Drum MDA Board	1
42	79V29108	Tapping Screw	Display Board	3
43	79V29468	Tapping Screw	Terminal Board	4
44	79V23483	Screw	Mix Booster	3
⚠ 45	79V29568	RF Modulator		1
46	79V29569	Bracket	RF Modulator	1
47	79V29251	Tapping Screw	Bracket	1
⚠ 48	–	Fuse	REF: 01 (F1)	1
⚠ 49	–	Fuse	REF: 02 (F3, F5, F6)	3
50	–	–		–
Chassis Components				
61	79V29570	Foot	Bottom Side	4
62	79V29299	Earth Bracket	under the Power Trans.	1
63	79V29109	Tapping Screw	Earth Bracket	1
64	79V29298	Hinge	Tuner/IF Board	2
65	79V29109	Tapping Screw	Hinge of Tuner/IF Board	2
66	79V29571	Hinge	Video Board	2
67	79V29109	Tapping Screw	Hinge of Video Board	2
68	79V22541	Wire Clamp	Small	1
69	79V22540	Wire Clamp	Large	2
70	79V29572	Tapping Screw	Bottom Rear Side	1

M 3 MECHANISM ASSEMBLY (1)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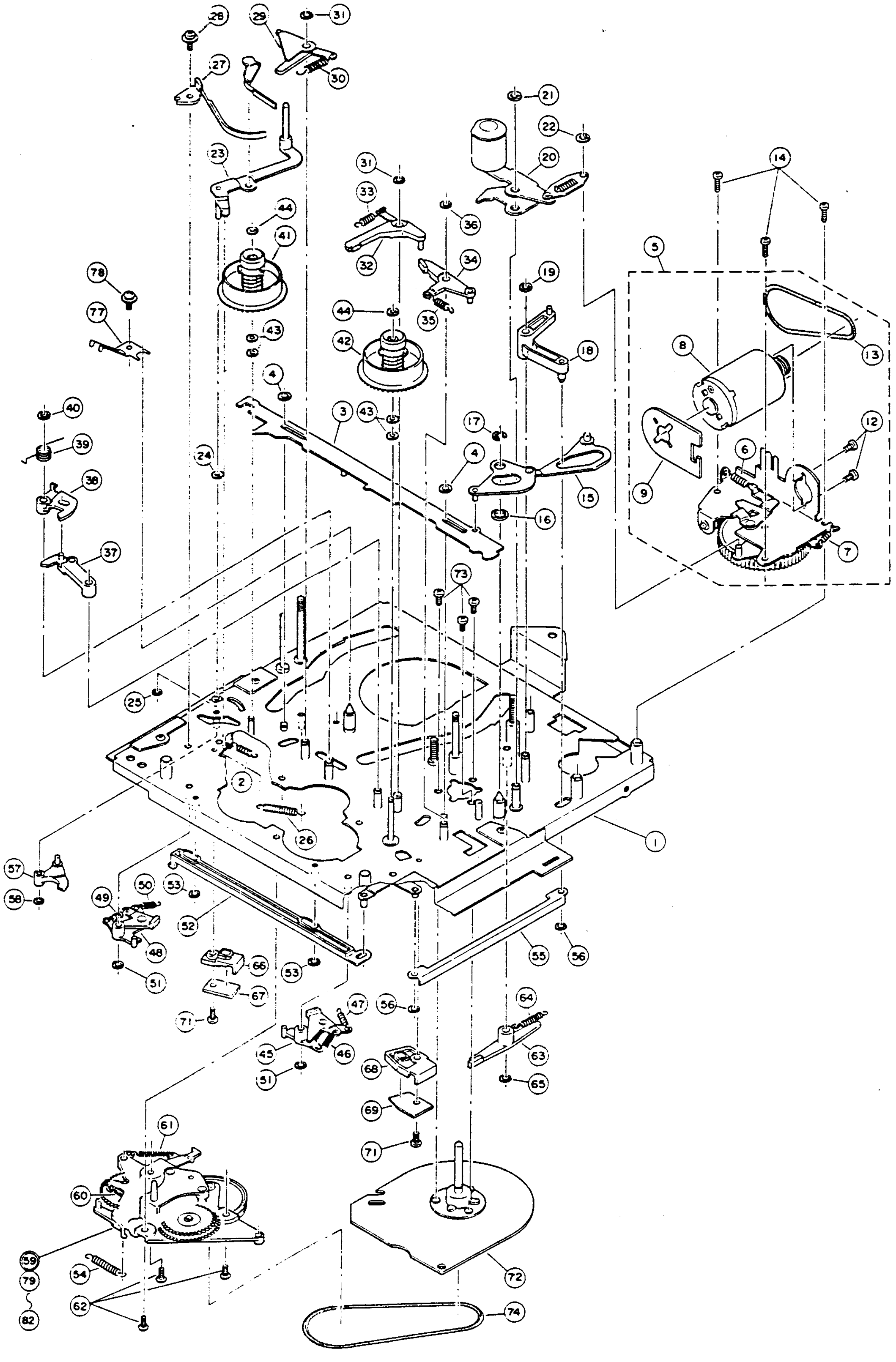
M 3 MECHANISM ASSEMBLY (1)

Symbol No.	Part No.	Part Name	Description	Q'ty
1	79V29573	Upper Drum Ass'y		1
2	79V29310	Screw	Upper Drum Ass'y	2
⚠ 3	79V29574	Lower Drum Motor Ass'y	Incl. ④, ⑤, (79), (81) and (82)	1
4	·	Pick-up Head Ass'y		1
5	79V29311	Mini Screw		1
6	79V29312	Screw	Lower Drum Motor Ass'y	3
7	–	Preamp Board Ass'y	REF: $\boxed{1}\boxed{6}$	1
8	79V23188	Screw	Pre Amp Board	2
9	79V29576	Shield Case	Pre Amp Board	1
10	79V29315	Loading Guide (TU)		1
11	79V29316	Loading Guide (SUP)		1
12	79V29577	Special Screw	Loading Guide (TU/SUP)	6
13	79V29578	Loading Ring Ass'y (SUP)	Incl. ⑭	1
14	79V29319	Spring		1
15	79V29579	Loading Ring Ass'y (TU)	Incl. ⑯	1
16	79V29319	Spring		1
17	79V29321	Collar	Loading Ring (TU/SUP)	6
18	79V29322	Collar		3
19	79V29323	Slit Washer		3
20	79V29580	Loading Gear (1) Ass'y		1
21	79V29325	Slit Washer		1
22	79V29326	Loading Gear (2)		1
23	79V29327	Spring	Torsion Spring	1
24	79V29328	Slit Washer		1
25	79V29329	Connect Gear (1)	Right	1
26	79V29330	Connect Gear (2)	Left	1
27	79V29331	Slit Washer	Connect Gear (1 & 2)	2
28	79V29581	Full Erase Head Arm Ass'y	Incl. ㉙ – ㉜	1
29	79V20306	Full Erase Head		1
30	79V20514	Screw		1
31	79V29333	Spring	Torsion Spring	1
32	–	Full Erase Head Board	REF: $\boxed{1}\boxed{7}$	1
33	–	–		–
34	79V29334	Spring	Supply Guide Pole	1
35	–	–		–
36	79V29336	Tape Guide	SUP/TU Guide Pole	2
37	79V29337	Guide Flange	Supply Guide Pole	2
38	79V29338	Nylon Nut	Supply Guide Pole	1
39	79V29339	A/CTL Head Ass'y	Incl. ㊵ – ㊹	1
40	79V29340	Pin		1
41	79V29341	Screw		1
42	79V29342	Screw		1
43	79V29343	Spring		1
44	79V20863	E-Ring		1
45	–	A/CTL Head Board	REF: $\boxed{1}\boxed{2}$	1
46	–	–		–
47	–	–		–
48	79V29345	Spring	A/CTL Head Ass'y, Torsion	1
49	–	–		–
50	79V20688	Nylon Nut		1
51	79V29346	Taper Nut	A/CTL Head Adjustment	1
52	–	–		–
53	79V29348	Guide Flange	Take-up Guide Pole	1
54	79V29582	Guide Arm Ass'y	for Reverse Playback	1
55	79V29350	Spring	Torsion Spring	1

Symbol No.	Part No.	Part Name	Description	Q'ty
56	79V29331	Slit Washer		1
57	79V29583	Pole Base Ass'y (TU)		1
58	79V29584	Pole Base Ass'y (SUP)		1
59	79V29353	Flange Screw	Loading Ring (TU/SUP)	2
60	79V29354	LED Holder		1
61	79V25304	LED	Cassette Lamp	1
62	79V29585	Cue Head		1
63	-	LED Board	REF: $\boxed{1}\boxed{5}$	1
64	79V23189	Screw	LED Holder	1
65	-	Photo Sensor	Loading Sensor, REF: $\boxed{1}\boxed{4}$	1
66	79V23189	Screw		1
67	79V29358	Brush Ass'y	under the .Commutator	1
68	79V24517	Screw		1
69	-	-		-
70	-	-		-
71	79V29586	Guide Flange	Take-up Guide Pole	1
72	-	Loading Sensor Board	REF: $\boxed{1}\boxed{4}$	1
73	-	-		-
74	79V29587	Guide Pole Cap	Take-up Guide Pole	1
75	79V29368	Shield Cap	A/CTL Head Ass'y	1
76	79V29364	Bracket	A/CTL Head Ass'y	1
77	79V29365	Screw	A/CTL Head Ass'y	1
78	-	-		-
79	79V29366	Commutator	Lower Drum Motor Ass'y	1
80	79V20882	Screw	Take-up Guide Pole	1
81	-	Drum Motor Conn.Board Ass'y	REF: $\boxed{2}\boxed{3}$	1
82	-	Drum FG Board	REF: $\boxed{2}\boxed{7}$	1

M 4 MECHANISM ASSEMBLY (2)



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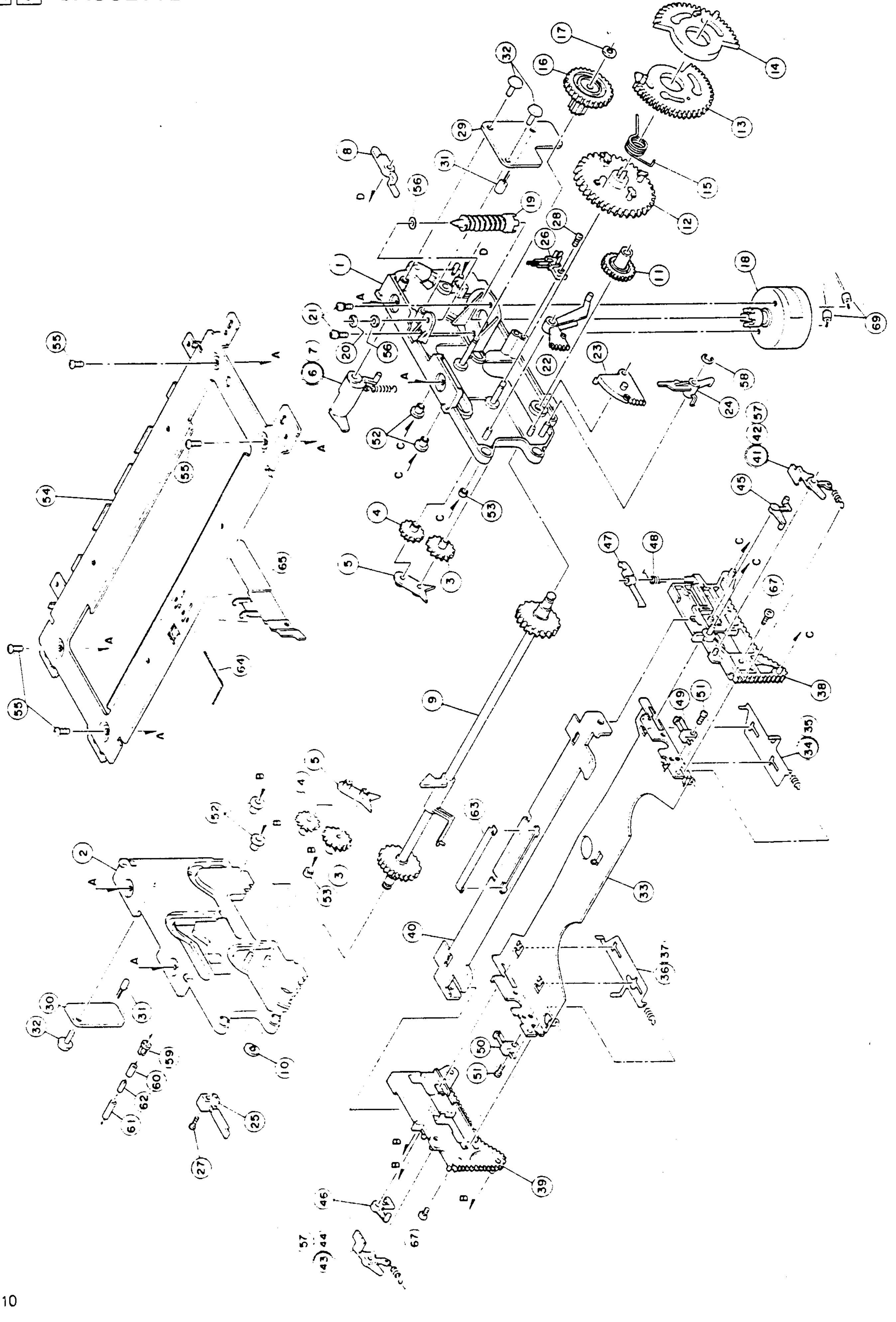
Symbol No.	Part No.	Part Name	Description	Q'ty
56	79V29331	Slit Washer	Push Plate	2
57	79V29401	Cancel Lever Ass'y (2)		1
58	79V29394	Slit Washer		1
59	79V29597	Clutch Mechanism Ass'y	Incl. (60), (61) and (79) – (82)	1
60	79V29403	Spring		1
61	79V29404	Spring		1
62	79V29405	Screw	Clutch Mechanism Ass'y	3
63	79V29406	Motor Brake Ass'y	Capstan, Incl. (64)	1
64	79V29407	Spring		1
65	79V29325	Slit Washer		1
66	–	Reel Sensor Ass'y (SUP)	Incl. (67), REF: $\boxed{2}\boxed{1}$	1
67	–	Sensor Board	REF: $\boxed{2}\boxed{1}$	1
68	–	Reel Sensor Ass'y (TU)	Incl. (69), REF: $\boxed{2}\boxed{2}$	1
69	–	Sensor Board	REF: $\boxed{2}\boxed{2}$	1
70	–	–		–
71	79V29412	Tapping Screw	SUP/TU Reel Sensor Boards	2
72	79V29598	Capstan Motor Ass'y	Direct Drive Motor	1
73	79V29413	Screw	Capstan Motor Ass'y	3
74	79V29414	Belt	Reel	1
75	–	–		–
76	–	–		–
77	79V29599	Earth Plate	for Cassette Holder	1
78	79V29600	Screw	Earth Plate	1
79	79V29601	Take-up Clutch		1
80	79V29602	Supply Clutch		1
81	79V20215	Washer	for TU and SUP Clutch	2
82	79V29603	Slit Washer	for TU and SUP Clutch	2

M 4 MECHANISM ASSEMBLY (2)

Symbol No.	Part No.	Part Name	Description	Q'ty
1	79V29588	Main-Deck Ass'y	Incl. ②	1
2	79V29368	Spring		1
3	79V29369	Slide Plate Ass'y		1
4	79V29331	Slit Washer		2
5	79V29589	Drive Gear Bracket Ass'y	Incl. ⑥ – ⑨, ⑫ and ⑬	1
6	79V29371	Spring		1
7	79V29372	Spring		1
⚠ 8	79V27203	Motor Ass'y	Mode Control	1
9	–	Mode CTL Motor Board	REF: 3 0	1
10	–	–		–
11	–	–		–
12	79V25402	Screw	Mode CTL Motor	2
13	79V27134	Belt	Loading	1
14	79V20888	Screw	Drive Gear Bracket Ass'y	3
15	79V29375	Lever Ass'y		1
16	79V29590	Collar		1
17	79V29377	E-Ring		1
18	79V29378	Cam Arm Ass'y		1
19	79V29325	Slit Washer		1
20	79V29591	Pinch Roller Arm Ass'y		1
21	79V29325	Slit Washer		1
22	79V29331	Slit Washer		1
23	79V29380	Tension Arm Ass'y		1
24	79V20216	Washer	Tention Arm	1
25	79V29381	Slit Washer	Tension Arm Ass'y	1
26	79V29382	Spring	Tension Arm ass'y	1
27	79V29592	Tension Band Ass'y		1
28	79V23189	Screw		1
29	79V29384	Loading Brake Ass'y (SUP)	Incl. ㉚	1
30	79V29385	Spring		1
31	79V29325	Slit Washer	SUP/TU Loading Brake	2
32	79V29386	Loading Brake Ass'y (TU)	Incl. ㉝	1
33	79V29387	Spring		1
34	79V27206	Search Brake Ass'y	Incl. ㉟	1
35	79V29388	Spring		1
36	79V29325	Slit Washer		1
37	79V29593	Gear Lever Ass'y (TU)		1
38	79V29390	Gear Lever (SUP)		1
39	79V29596	Spring	Torsion Spring	1
40	79V29328	Slit Washer	Gear Lever (SUP)	1
41	79V29594	Reel Disk (SUP)		1
42	79V29595	Reel Disk (TU)		1
43	79V20319	Washer	Reel Disk Height Adj.	4
44	79V29394	Slit Washer	Reel Disk (SUP/TU)	2
45	79V29395	Main Brake Ass'y (TU)	Incl. ㊻ and ㊼	1
46	79V29396	Spring		1
47	79V29397	Spring		1
48	79V29469	Main Brake Ass'y (SUP)	Incl. ㊾ and ㊿	1
49	79V29396	Spring		1
50	79V29397	Spring		1
51	79V29325	Slit Washer	Main Brake Ass'y (SUP/TU)	2
52	79V29398	Main Brake Slider		1
53	79V29331	Slit Washer		2
54	79V29399	Spring	to Clutch Mechanism, Ass'y	1
55	79V29400	Push Plate		1

M 5 CASSETTE HOUSING ASSEMBLY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M 5 CASSETTE HOUSING ASSEMBLY

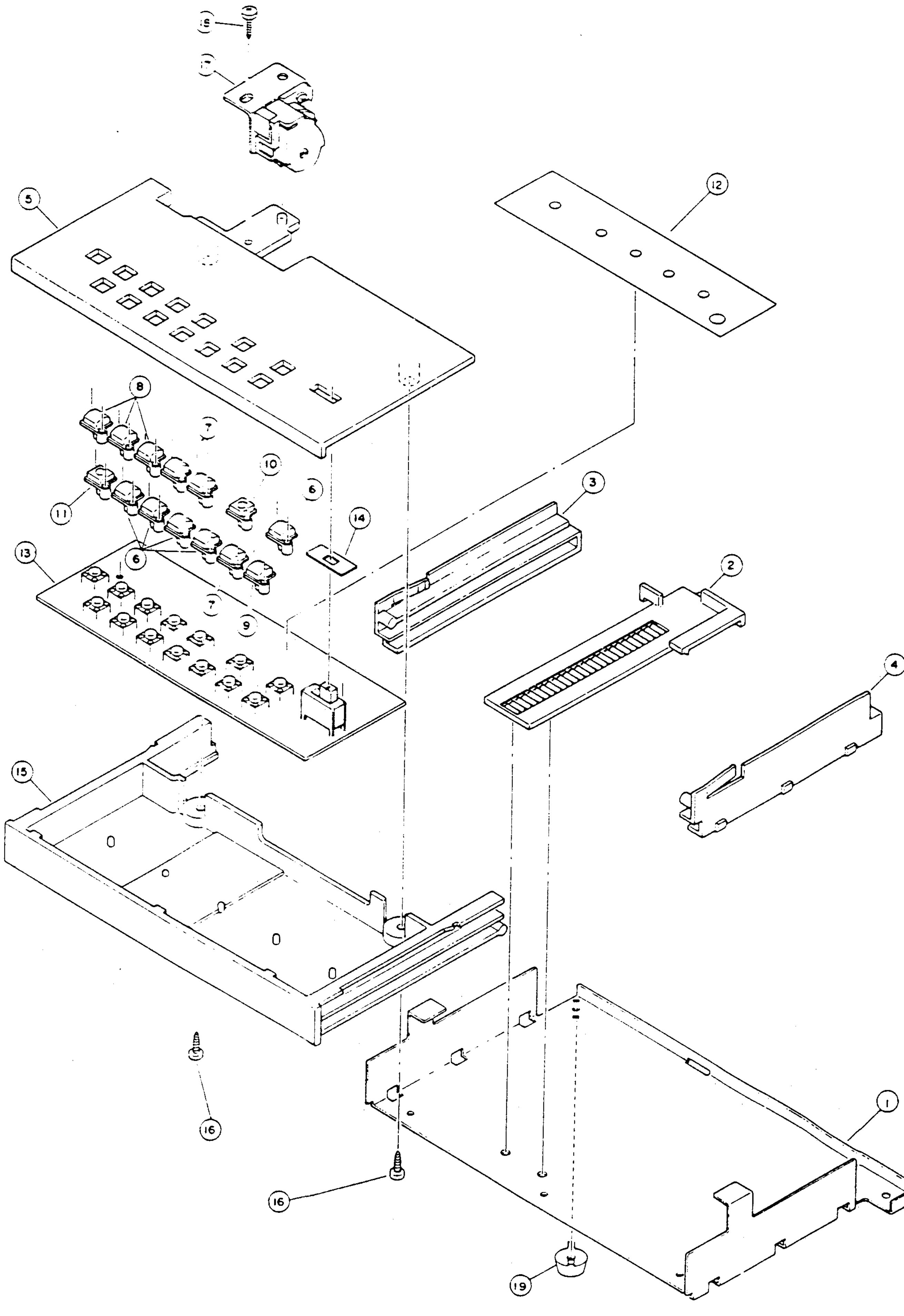
Symbol No.	Part No.	Part Name	Description	Q'ty
–	79V29428	Cassette Housing Ass'y	Incl. ①–(65), (67) and (69)	1
1	79V29604	Guide Stay (R) Ass'y		1
2	79V29605	Guide Stay (L) Ass'y		1
3	79V23245	Gear (1)		2
4	79V23246	Gear (2)		2
5	79V23247	Double Cap		2
6	79V23265	Door Guide Ass'y	Incl. ⑦	1
7	79V23306	Spring		1
8	79V23248	Guide Lever		1
9	79V23266	Connect Gear Ass'y		1
10	79V23318	Slit Washer	Connect Gear Ass'y	1
11	79V23249	Cam Gear (2)		1
12	79V23221	Cam Gear (1)		1
13	79V23250	L Slide Gear	Loading	1
14	79V23251	UL Slide Gear	Unloading	1
15	79V23252	Limiter Spring		1
16	79V25330	Worm Wheel		1
17	79V20213	Slit Washer	Worm Wheel	1
⚠ 18	79V23050	Motor Ass'y	Cassette Motor	1
19	79V25320	Worm Ass'y		1
20	79V20944	Slit Washer		1
21	79V29606	Screw	Motor Ass'y	2
22	79V23254	Upper Door Opener		1
23	79V23255	Lower Door Opener		1
24	79V25735	Hold Lever	Lower Door Opener	1
25	79V23054	Leaf Switch	REC SAFETY	1
26	79V25715	End Switch	HOUSING UP/DOWN Detector,	1
27	79V23489	Screw	REC SAFETY Switch	1
28	79V23479	Tapping Screw	END Switch	1
29	–	Cassette Housing Board	REF: 1 8	1
30	–	End Sensor Board	REF: 1 3	1
31	–	Photo Transistor	Start/End Sensors	2
32	79V20677	Stopper	Casstte Housing/ESNS Boards	3
33	79V29607	Cassette Holder		1
34	79V23268	Slide Plate (R) Ass'y	Incl. ㉟	1
35	79V23307	Spring		1
36	79V29419	Slide Plate (L) Ass'y	Incl. ㊲	1
37	79V23307	Spring		1
38	79V29420	Bracket (Right)		1
39	79V25726	Bracket (Left)		1
40	79V29421	Reinforcement		1
41	79V29608	Lock Lever (R)Ass'y	Incl. ㊷ and ①	1
42	79V23305	Spring		1
43	79V29609	Lock Lever (L) Ass'y	Incl. ㊹ and ①	1
44	79V23305	Spring		1
45	79V23257	Switch Lever (R) Ass'y		1
46	79V23258	Switch Lever (L) Ass'y		1
47	79V27432	Lid Opener		1
48	79V23260	Spring		1
49	79V29610	Insert Switch (Right)	CASS. IN Detector	1
50	79V29611	Insert Switch (Left)	CASS. IN Detector	1
51	79V23486	Screw	Insert Switch (R/L)	2
52	79V23261	Roller		4
53	79V26911	Mini Roller	Guide Stay (R/L)	2
54	79V29422	Roof Plate		1
55	79V23478	Tapping Screw	Roof Plate	1

Symbol No.	Part No.	Part Name	Description	Q'ty
56	79V23472	Washer	Worm Ass'y	2
57	79V25724	Pad	Lock Lever Ass'y (R/L)	2
58	79V23475	E-Ring	Hold Lever	1
59	79V23298	Wire Cap		1
60	79V20861	UL Tube		1
61	79V23469	UL Tube		1
62	79V29612	UL Tube		1
63	79V29423	Guard	Reinforthment	1
64	79V29424	Rod	Roof Plate	1
65	79V29425	Upper Door Stopper		1
66	–	–		–
67	79V23487	Screw	Bracket (Left/Right)	2
68	–	–		–
69	79V20660	Ferrite Beads	Motor Ass'y	2

$\boxed{M}\boxed{6}$ PROGRAM ASSEMBLY

Symbol No.	Part No.	Part Name	Description	Q'ty
1	79V29613	Drawer Cover		1
2	79V29614	Rack		1
3	79V29431	Guide Rail (L)		1
4	79V29432	Guide Rail (R)		1
5	79V29615	Upper Cover		1
6	79V29616	Button (PROGRAM	Gray	5
7	79V29617	Button (PROGRAM	Orange	3
8	79V29618	Button (PROGRAM	Red	3
9	79V29619	Button (PROGRAM	Green	1
10	79V29620	Button (CANCEL	Gray	1
11	79V29621	Button (CANCEL	Green	1
12	79V29622	Spacer		1
13	–	Program Board Ass'y	REF: $\boxed{2}\boxed{5}$	1
14	79V29623	Dust Spacer		1
15	79V29624	Lower Cover		1
16	79V29438	Tapping Screw	Lower Cover	2
17	79V29625	Drive Unit Ass'y		1
18	79V29439	Tapping Screw	Drive Unit Ass'y	1
19	79V29626	Foot	Drawer Cover	1

M 6 PROGRAM ASSEMBLY



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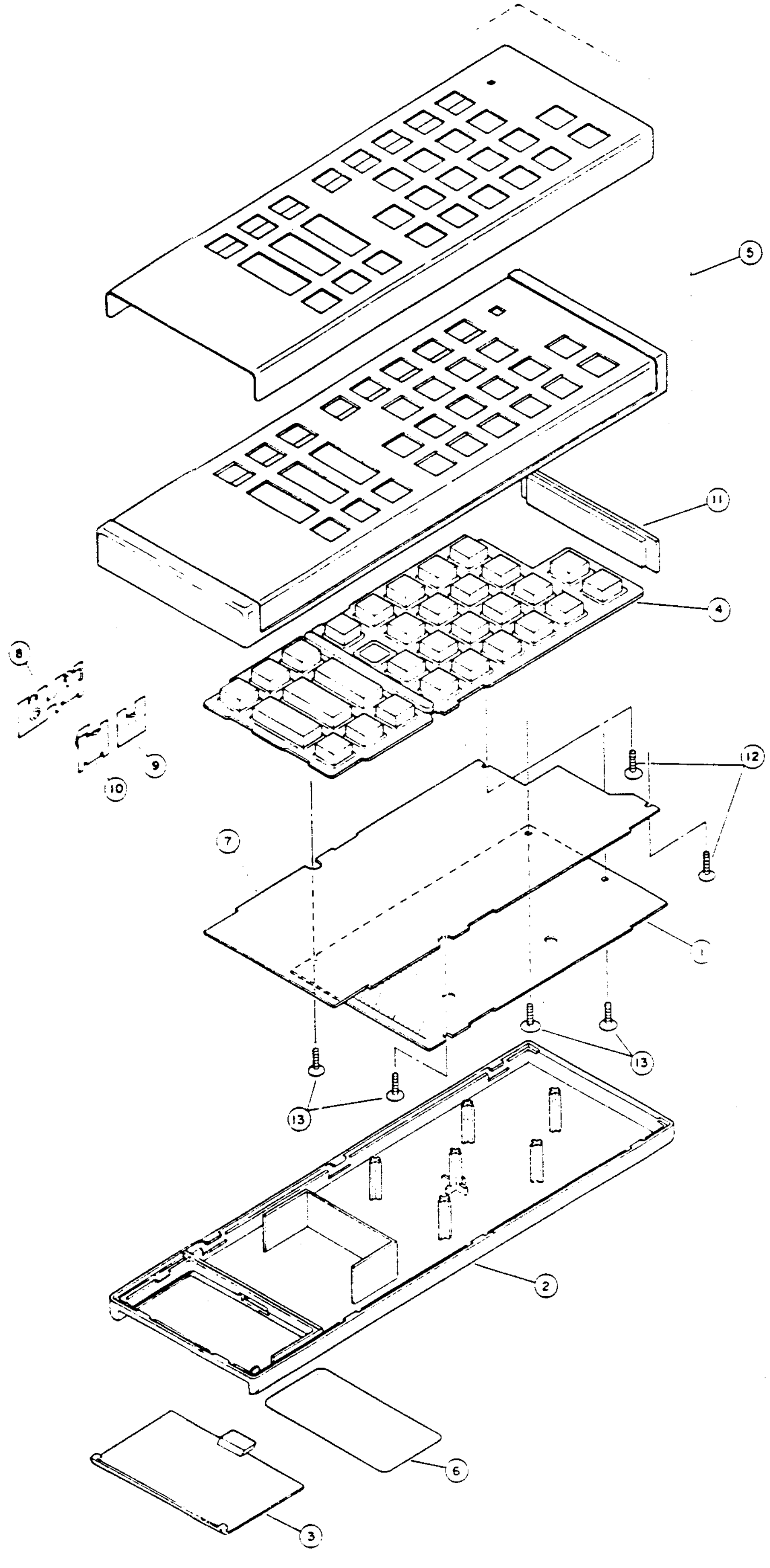
M 7 REMOTE CONTROL UNIT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M 7 REMOTE CONTROL UNIT

Symbol No.	Part No.	Part Name	Description	Q'ty
–	79V29627	Remote Control Unit	Incl. ①–⑬	1
1	–	Circuit Board Ass'y	REF: R M	1
2	79V29443	Bottom Case		1
3	79V29444	Battery Cap		1
4	79V29628	Button		1
5	79V29629	Top Panel Ass'y		1
6	79V29446	Battery Label		1
7	79V29630	Operation Board		1
8	79V29448	Battery Terminal (A)		1
9	79V29449	Battery Terminal (B)		1
10	79V29450	Battery Terminal (C)		1
11	79V29451	Filter		1
12	79V29452	Tapping Screw	Operation Board	2
13	79V29453	Tapping Screw	Circuit Board Ass'y	4

SECTION 7
ELECTRICAL PARTS LIST BY ASSEMBLY

ASS'Y No.	ASSEMBLY	Page
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01 POWER TRANSFORMER ASSEMBLY 79V29636

Symbol No.	Part No.	Part Name	Description
⚠	79V29635	Power Trans. Board	
⚠ C1	79V23012	MM Cap	
⚠ T1	79V29637	Line Filter	
	79V20762	Test Pin	TP1, 2
⚠	79V20722	Fuse Clip	× 2
⚠	79V20262	Tab	× 2
⚠	79V29638	Power Transformer	
⚠ SW1	79V21102	Seesaw Switch	
⚠	79V29639	Power Bracket	
⚠	79V23484	Screw	× 2
⚠	79V29640	Screw	
⚠	79V29086	Insulator	
⚠	79V20023	Power Cord	
⚠	79V21018	Seesaw Switch Cover	
⚠ F1	79V29641	Fuse (Not included in Power .Transformer Ass'y)	

NOTE: "× 2" indicates two pieces.

02 REGULATOR BOARD ASSEMBLY.... 79V29642

Symbol No.	Part No.	Part Name	Description
IC1	79V27109	IC, BA6122A	
⚠ IC2	79V27162	IC, TA78009AP	
⚠ Q1	79V20071	TR, 1020, O, Y	
⚠ Q2	79V27186	TR, 2SC2562O	
⚠ Q3	79V27182	TR, 2SA1012Y	
⚠ Q4	79V20165	TR, 2SB772P, Q	
Q5	79V27213	TR, 2SA1282AF	
Q6	–	–	
Q7	79V20191	TR, 2SC2655, O, Y	
Q8	79V20932	TR, 2SB637, R, S	
⚠ Q9	79V22038	TR, 2SB744Q	
⚠ Q10	79V23100	TR, 2SD1128-08	
D1	79V27195	Diode 4B4B42	
⚠ D2	79V27194	Diode 31DQ04	
D3	79V23119	Diode 11E2	
D4	79V27118	Zener Diode HZ12A2	
D5	79V27177	Diode 11DQ04	
D6	79V23114	Diode Array DAN201	
⚠ D7	79V20140	Diode 10E2	
⚠ D8	79V20140	Diode 10E2	
D9	79V27120	Zener Diode HZ16-3	
D10	79V23119	Diode 11E2	
D11	79V23119	Diode 11E2	
D12	79V23115	Diode Array DAP201	
D13	79V23119	Diode 11E2	
D14	79V23119	Diode 11E2	
D15	79V27119	Zener Diode HZ15-2	
D16	79V27119	Zener Diode HZ15-2	
D17	79V23119	Diode 11E2	
D18	79V23119	Diode 11E2	
D19	79V23119	Diode 11E2	
D20	79V20075	Diode MA150	
⚠ R1	79V29092	CR	
⚠ R2	79V23014	CR	
R3	QRD122J-222	CR	
⚠ R4	79V29643	FR	
R5	QRD181J-822	CR	
R6	QRD181J-222	CR	
⚠ R7	79V29095	OMR	
⚠ R8	79V26948	OMR	
R9	QRD181J-393	CR	
R10	QRD181J-123	CR	
R11	QRD181J-103	CR	
R12	79V29002	VR	12.5V ADJ
R13	QRD181J-272	CR	
R14	QRD181J-152	CR	
R15	QRD181J-331	CR	
R16	QRD181J-123	CR	
R17	79V29003	VR	6.0V ADJ
R18	QRD181J-103	CR	
R19	QRD181J-222	CR	
R20	QRD181J-471	CR	

Symbol No.	Part No.	Part Name	Description
⚠ R21	79V29096	OMR	
R22	-	-	
R23	QRD181J-103	CR	
R24	QRD181J-122	CR	
R25	QRD181J-392	CR	
R26	QRD181J-103	CR	
⚠ R27	79V29097	OMR	
⚠ R28	79V25391	CR	
R29	QRD181J-123	CR	
⚠ R30	79V29644	Posistor	
⚠ R31	79V29644	Posistor	
⚠ C1	79V22544	C Cap	
C2	-	-	
⚠ C3	79V22544	C Cap	
⚠ C4	79V22544	C Cap	
⚠ C5	79V22544	C Cap	
⚠ C6	79V22544	C Cap	
⚠ C7	79V22544	C Cap	
⚠ C8	79V22544	C Cap	
⚠ C9	79V22544	C Cap	
C10	QCF32HP-103	C Cap	
C11	QCF32HP-103	C Cap	
⚠ C12	79V29098	E Cap	
C13	QET61HM-105	E Cap	
⚠ C14	79V29099	E Cap	330μF/25V
C15	79V29099	E Cap	330μF/25V
C16	QET61EM-476	E Cap	
C17	QET61EM-476	E Cap	
C18	QET61EM-226	E Cap	
C19	QFN31HJ-102	MY Cap	
C20	QET61EM-475	E Cap	
C21	QCF31HP-472	C Cap	
C22	QCF31HP-472	C Cap	
C23	QET61EM-227	E Cap	
C24	QEM51AK-107	E Cap	
C25	QCF31HP-222	C Cap	
C26	QEM51AK-107	E Cap	
⚠ C27	79V29100	E Cap	
C28	QET61EM-476	E Cap	
C29	QET61JM-107	E Cap	
C30	QET61JM-107	E Cap	
⚠ C31	79V29645	E Cap	220μF/63V
C32	QET61HM-226	E Cap	
C33	QET61EM-107	E Cap	
C34	-	-	
C35	QET50JM-227	E Cap	
⚠ C36	79V29645	E Cap	220μF/63V

Symbol No.	Part No.	Part Name	Description
⚠ L1	79V29049	Choke Coil	
⚠ L2	79V29050	Choke Coil	
L3	79V29051	Choke Coil	
L4	79V29052	Choke Coil	
L5	79V29053	Choke Coil	
L6	79V29465	Choke Coil	
CN1	79V29032	Cap. Housing	TERMINAL
CN2	-	-	
CN3	79V29033	Cap. Housing	TUNER/IF
CN4	-	-	
CN5	79V22071	Cap. Housing	VIDEO
CN6	79V29034	Cap. Housing	MECHACON
CN7	79V21021	Cap. Housing	P. TRANS
	79V23423	Test Pin	TP1, 5, 9
⚠ K1	79V29101	Ferrite Beads	
⚠ K2	79V29101	Ferrite Beads	
	79V20658	Spacer	×3
	79V20625	Isolation Washer	×3
⚠	79V29536	Heat Sink	
	79V23189	Screw	×4
	79V29651	Screw	for R31
⚠	79V20722	Fuse Clip	×6
	79V29646	Spacer	
	79V29647	Nut	for R31
	79V29107	Screw	
	79V25402	Screw	×3
	79V29102	Spacer	

[The following are not included in Regulator Board Ass'y.]

⚠ F3	79V29648	Fuse	
F4	-	-	
⚠ F5	79V29650	Fuse	
⚠ F6	79V29649	Fuse	

NOTE: "×3", "×4" & "×6" indicates three, four and six pieces.

03 VIDEO BOARD ASSEMBLY............ 79V29652

Symbol No.	Part No.	Part Name	Description
[Y Section]			
IC1	79V27179	IC, 12VT14	
IC2	79V29653	IC, 5VT09	
IC3	79V27101	IC, AN6305	
IC4	79V27106	IC, AN6393	
IC5	79V27102	IC, AN6327	
IC6	79V27105	IC, AN6392	
IC7	79V29114	IC, AN6306	
IC8	79V29654	IC, T8004	
IC9	79V29655	IC, TL6704P	
IC10	79V29656	IC, BA7024	
IC11	79V27113	IC, BA7021	
IC12	79V29657	IC, M51457AP	
Q1	79V20100	TR, 2SC2021Q, R, S	
Q2	79V20100	TR, 2SC2021Q, R, S	
Q3	79V20100	TR, 2SC2021Q, R, S	
Q4	79V29658	TR, DTA114EF	
Q5	79V20917	TR, 2SB641Q	
Q6	79V20100	TR, 2SC2021Q, R, S	
Q7	79V20100	TR, 2SC2021Q, R, S	
Q8	79V29659	TR, DTC114EF	
Q9	79V29659	TR, DTC114EF	
Q10	79V20100	TR, 2SC2021Q, R, S	
Q11	79V20917	TR, 2SB641Q	
Q12	79V23113	F.E.T. 2SK381C	
Q13	79V20100	TR, 2SC2021Q, R, S	
Q14	79V20917	TR, 2SB641Q	
Q15	79V20917	TR, 2SC641Q	
Q16	79V20100	TR, 2SC2021Q, R, S	
Q17	79V20100	TR, 2SC2021Q, R, S	
Q18	79V29660	TR, 2SD638R	
Q19	79V20100	TR, 2SC2021Q, R, S	
Q20	79V20100	TR, 2SC2021Q, R, S	
Q21	79V20100	TR, 2SC2021Q, R, S	
Q22	79V20100	TR, 2SC2021Q, R, S	
Q23	79V29659	TR, DTC114EF	
Q24	79V29659	TR, DTC114EF	
Q25	79V20917	TR, 2SB641Q	
Q26	79V20917	TR, 2SB641Q	
Q27	79V20100	TR, 2SC2021Q, R, S	
Q28	79V20917	TR, 2SB641Q	
Q29	79V20100	TR, 2SC2021Q, R, S	
Q30	79V20100	TR, 2SC2021Q, R, S	
Q31	79V20917	TR, 2SB641Q	
Q32	–	–	
Q33	–	–	
Q34	–	–	
Q35	79V20100	TR, 2SC2021Q, R, S	
Q36	79V29659	TR, DTC114EF	
Q37	79V20100	TR, 2SC2021Q, R, S	
Q38	79V20917	TR, 2SB641Q	
Q39	79V20917	TR, 2SB641Q	
⚠ Q40	79V26506	TR, 2SB810J	
⚠ Q41	79V26506	TR, 2SB810J	
Q42	79V29658	TR, DTA114EF	
Q43	79V20917	TR, 2SB641Q	
Q44	79V20100	TR, 2SC2021Q, R, S	
⚠ Q45	79V23500	TR, 2SB822R	

Symbol No.	Part No.	Part Name	Description
Q46	79V20919	TR, 2SB643R	
Q47	79V20100	TR, 2SC2021Q, R, S	
Q48	79V29659	TR, DTC114EF	
Q49	79V29659	TR, DTC114EF	
Q50	79V20100	TR, 2SC2021Q, R, S	
Q51	79V29659	TR, DTC114EF	
Q52	79V20100	TR, 2SC2021Q, R, S	
Q53	–	–	
Q54	79V29659	TR, DTC114EF	
Q55	79V29659	TR, DTC114EF	
D1	79V20173	Diode 1SS133	
D2	79V20173	Diode 1SS133	
D3	79V20173	Diode 1SS133	
D4	79V20173	Diode 1SS133	
D5	79V20173	Diode 1SS133	
D6	79V20173	Diode 1SS133	
D7	79V20173	Diode 1SS133	
D8	79V20173	Diode 1SS133	
D9	79V20173	Diode 1SS133	
D10	79V20173	Diode 1SS133	
D11	79V20173	Diode 1SS133	
D12	79V20173	Diode 1SS133	
D13	79V20173	Diode 1SS133	
D14	79V20173	Diode 1SS133	
D15	79V20096	Zener Diode RD3.3EB	
D16	79V27176	Diode 1SS99	
D17	79V20173	Diode 1SS133	
Q18	–	–	
D19	79V20173	Diode 1SS133	
Q20	–	–	
Q21	–	–	
D22	79V20173	Diode 1SS133	
D23	79V20373	Diode OA90	
D24	79V20173	Diode 1SS133	
D25	79V20173	Diode 1SS133	
D26	79V20173	Diode 1SS133	
D27	79V20173	Diode 1SS133	
D28	79V20173	Diode 1SS133	
D29	79V20173	Diode 1SS133	
D30	79V20173	Diode 1SS133	
D31	79V20173	Diode 1SS133	
D32	79V20173	Diode 1SS133	
D33	79V20173	Diode 1SS133	
D34	79V20173	Diode 1SS133	
D35	79V20173	Diode 1SS133	
D36	79V20173	Diode 1SS133	
D37	79V20173	Diode 1SS133	
D38	79V20173	Diode 1SS133	
D39	79V20173	Diode 1SS133	
D40	79V20173	Diode 1SS133	
D41	79V20173	Diode 1SS133	

Symbol No.	Part No.	Part Name	Description
R1	QRD161J-681	CR	
R2	QRD161J-681	CR	
R3	QRD161J-102	CR	
R4	QRD161J-102	CR	
R5	QRD161J-473	CR	
R6	QRD161J-332	CR	
R7	QRD161J-471	CR	
R8	QRD161J-103	CR	
R9	QRD161J-102	CR	
R10	QRD161J-102	CR	
R11	QRD161J-103	CR	
R12	QRD161J-103	CR	
R13	QRD161J-272	CR	
R14	QRD161J-223	CR	
R15	QRD161J-102	CR	
R16	QRD161J-102	CR	
R17	QRD161J-223	CR	
R18	QRD161J-223	CR	
R19	QRD161J-102	CR	
R20	QRD161J-102	CR	
R21	QRD161J-181	CR	
R22	QRD161J-122	CR	
R23	QRD161J-182	CR	
R24	QRD161J-152	CR	
R25	QRD161J-102	CR	
R26	QRD161J-102	CR	
R27	QRD161J-102	CR	
R28	QRD161J-821	CR	
R29	79V29661	VR	SP PB EQ
R30	QRD161J-103	CR	
R31	QRD161J-103	CR	
R32	QRD161J-122	CR	
R33	QRD161J-392	CR	
R34	QRD161J-122	CR	
R35	QRD161J-223	CR	
R36	QRD161J-223	CR	
R37	QRD161J-391	CR	
R38	QRD161J-152	CR	
R39	QRD161J-391	CR	
R40	QRD161J-102	CR	
R41	QRD161J-471	CR	
R42	QRD161J-331	CR	
R43	79V29662	VR	SHARPNESS PRESET
R44	QRD161J-153	CR	
R45	QRD161J-103	CR	
R46	QRD161J-332	CR	
R47	QRD161J-222	CR	
R48	QRD161J-182	CR	
R49	QRD161J-471	CR	
R50	QRD161J-222	CR	
R51	QRD161J-222	CR	
R52	QRD161J-222	CR	
R53	QRD161J-183	CR	
R54	QRD161J-684	CR	
R55	QRD161J-564	CR	
R56	QRD162J-154	CR	
R57	QRD161J-122	CR	
R58	QRD161J-102	CR	
R59	79V29663	VR	PB COLOUR
R60	QRD161J-222	CR	
R61	QRD161J-122	CR	
R62	QRD161J-103	CR	
R63	QRD161J-822	CR	
R64	QRD161J-332	CR	
R65	QRD161J-331	CR	
R66	QRD161J-393	CR	
R67	QRD161J-152	CR	
R68	QRD161J-820	CR	
R69	QRD161J-121	CR	
R70	QRD161J-222	CR	
R71	79V29664	VR	SP REC COLOUR
R72	QRD161J-151	CR	
R73	QRD161J-331	CR	
R74	QRD161J-472	CR	
R75	79V29664	VR	LP REC COLOUR
R76	QRD161J-223	CR	
R77	QRD161J-223	CR	
R78	QRD161J-223	CR	
R79	QRD161J-152	CR	
R80	QRD161J-222	CR	
R81	QRD161J-222	CR	
R82	79V29665	VR	LP REC FM
R83	QRD161J-681	CR	
R84	QRD161J-222	CR	
R85	QRD161J-682	CR	
R86	QRD161J-392	CR	
R87	QRD161J-223	CR	
R88	QRD161J-181	CR	
R89	QRD161J-103	CR	
R90	QRD161J-223	CR	
R91	QRD161J-153	CR	
R92	QRD161J-151	CR	
R93	QRD161J-102	CR	
R94	-	-	
R95	QRD161J-563	CR	
R96	QRD161J-393	CR	
R97	QRD161J-470	CR	
R98	QRD161J-822	CR	
R99	QRD161J-103	CR	
R100	79V29666	VR	DARK CLIP
R101	QRD161J-103	CR	
R102	QVZ3514-103	VR	CARRIER
R103	QRD161J-102	CR	
R104	QRD161J-152	CR	
R105	79V29667	VR	DEVIATION
R106	QRD161J-272	CR	
R107	QRD161J-822	CR	
R108	79V29666	VR	WHITE CLIP
R109	QRD161J-682	CR	
R110	QRD161J-152	CR	
R111	QRD161J-682	CR	
R112	QRD161J-332	CR	
R113	QRD161J-222	CR	
R114	QRD161J-221	CR	
R115	QRD161J-563	CR	
R116	QRD161J-181	CR	
R117	QRD161J-272	CR	
R118	QRD161J-152	CR	
R119	QRD161J-562	CR	
R120	QRD161J-331	CR	
R121	-	-	
R122	QRD161J-152	CR	
R123	79V29666	VR	EE VIDEO LEVEL
R124	QRD161J-391	CR	

Symbol No.	Part No.	Part Name	Description
R125	QRD161J-561	CR	
R126	QRD161J-222	CR	
R127	QRD161J-224	CR	
R128	QRD161J-332	CR	
R129	QRD161J-222	CR	
R130	QRD161J-332	CR	
R131	QRD161J-393	CR	
R132	QRD161J-152	CR	
R133	QRD161J-183	CR	
R134	QRD161J-102	CR	
R135	79V29664	VR	PB Y
R136	QRD161J-222	CR	
R137	QRD161J-102	CR	
R138	QRD161J-102	CR	
R139	QRD161J-102	CR	
R140	79V29663	VR	NOISE BAL
R141	QRD161J-473	CR	
R142	QRD161J-183	CR	
R143	QRD161J-222	CR	
R144	-	-	
R145	QRD161J-223	CR	
R146	QRD161J-103	CR	
R147	-	-	
R148	-	-	
R149	-	-	
R150	-	-	
R151	QRD161J-182	CR	
R152	QRD161J-392	CR	
R153	QRD161J-821	CR	
R154	QRD161J-102	CR	
R155	QRD161J-272	CR	
R156	QRD161J-222	CR	
R157	QRD161J-684	CR	
R158	QRD161J-102	CR	
R159	QRD161J-103	CR	
R160	QRD161J-182	CR	
R161	QRD161J-331	CR	
R162	QRD161J-393	CR	
R163	QRD161J-102	CR	
R164	QRD161J-103	CR	
R165	-	-	
R166	QRD161J-473	CR	
R167	QRD161J-393	CR	
R168	QRD161J-561	CR	
R169	QRD161J-471	CR	
R170	QRD161J-102	CR	
R171	QRD161J-102	CR	
R172	QRD161J-471	CR	
R173	QRD161J-750	CR	
R174	QRD161J-563	CR	
⚠ R175	79V29668	CR	
R176	QRD161J-563	CR	
R177	QRD161J-272	CR	
R178	QRD161J-393	CR	
R179	QRD161J-472	CR	
R180	QRD161J-222	CR	
R181	QRD161J-682	CR	
R182	QRD161J-392	CR	
R183	QRD161J-393	CR	
⚠ R184	79V29669	CR	
R185	QRD161J-393	CR	
⚠ R186	79V29670	CR	
R187	QRD161J-392	CR	
R188	QRD161J-123	CR	

Symbol No.	Part No.	Part Name	Description
R189	QRD161J-272	CR	
R190	QRD161J-223	CR	
R191	QRD161J-223	CR	
R192	QRD181J-103	CR	
R193	QRD161J-750	CR	
R194	QRD161J-221	CR	
R195	QRD161J-102	CR	
R196	QRD161J-181	CR	
R197	QRD161J-821	CR	
R198	QRD161J-472	CR	
R199	79V29671	VR	DYAC ADJ
R200	QRD161J-472	CR	
R201	QRD161J-331	CR	
R202	QRD161J-682	CR	
R203	QRD161J-183	CR	
R204	QRD161J-103	CR	
R205	QRD161J-103	CR	
R206	QRD161J-332	CR	
R207	QRD161J-822	CR	
R208	QRD161J-223	CR	
R209	-	-	
R210	-	-	
R211	QRD161J-331	CR	
R212	QRD161J-563	CR	
R213	QRD161J-821	CR	
R214	QRD161J-222	CR	
R215	-	-	
R216	QRD161J-105	CR	
R217	QRD181J-475	CR	
R218	QRD161J-102	CR	
R219	QRD161J-123	CR	
R220	QRD161J-103	CR	
R221	QRD161J-122	CR	
R222	QRD161J-222	CR	
C1	QCF31HP-103	C Cap	
C2	QCF31HP-103	C Cap	
C3	QET60JM-336	E Cap	
C4	QCF31HP-223	C Cap	
C5	QCF31HP-223	C Cap	
C6	QFN31HJ-682	MY Cap	
C7	QEK60JM-336	E Cap	
C8	QCF31HP-223	C Cap	
C9	QCF31HP-223	C Cap	
C10	QFN31HJ-473	MY Cap	
C11	QCS31HJ-470	C Cap	
C12	QCF31HP-223	C Cap	
C13	QCF31HP-223	C Cap	
C14	QCF31HP-103	C Cap	
C15	QET60JM-336	E Cap	
C16	QCF31HP-223	C Cap	
C17	QET61CM-106	E Cap	
C18	QCF31HP-223	C Cap	
C19	QCF31HP-103	C Cap	
C20	QCS31HJ-471	C Cap	
C21	QCS31HJ-101	C Cap	
C22	QCF31HP-103	C Cap	
C23	QCS31HJ-680	C Cap	
C24	QCS31HJ-270	C Cap	
C25	QCS31HJ-270	C Cap	

Symbol No.	Part No.	Part Name	Description
C26	QET60JM-336	E Cap	
C27	QCS31HJ-470	C Cap	
C28	QCF31HP-223	C Cap	
C29	QCF11HP-103	C Cap	
C30	QCF11HP-103	C Cap	
C31	QET60JM-336	E Cap	
C32	QCS41HJ-560	C Cap	
C33	QCX11EM-153	C Cap	
C34	QFN31HJ-223	MY Cap	
C35	QCX11EM-103	C Cap	
C36	QCX11EM-103	C Cap	
C37	QET60JM-336	E Cap	
C38	QCF31HP-223	C Cap	
C39	QCX11EM-153	C Cap	
C40	QCS31HJ-470	C Cap	
C41	QCX11EM-153	C Cap	
C42	QCS41HJ-330	C Cap	
C43	QCF31HP-103	C Cap	
C44	QCF31HP-103	C Cap	
C45	QCS31HJ-220	C Cap	
C46	QET60JM-476	E Cap	
C47	QET60JM-476	E Cap	
C48	QCS41HJ-680	E Cap	
C49	QCF31HP-223	C Cap	
C50	QCY61HJ-331	C Cap	
C51	QCS31HJ-181	C Cap	
C52	-	-	
C53	QCF31HP-223	C Cap	
C54	QCX11EM-153	C Cap	
C55	QCS31HJ-820	C Cap	
C56	QCY61HJ-221	C Cap	
C57	QCS31HJ-270	C Cap	
C58	QCS31HJ-121	C Cap	
C59	QFN31HJ-222	MY Cap	
C60	QET61EM-475	E Cap	
C61	QCF31HP-222	C Cap	
C62	QET61CM-106	E Cap	
C63	QCF31HP-102	C Cap	
C64	QCY61HJ-561	C Cap	
C65	QCF31HP-103	C Cap	
C66	QET61HM-105	E Cap	
C67	QCY61HJ-151	C Cap	
C68	QCS41HJ-121	C Cap	
C69	QCF31HP-103	C Cap	
C70	QET61HM-105	E Cap	
C71	QCS41HJ-820	C Cap	
C72	QET60JM-337	E Cap	
C73	QCT25CH-390	C Cap	
C74	QCF31HP-223	C Cap	
C75	QEK61AM-476	E Cap	
C76	QCF31HP-223	C Cap	
C77	QET61CM-106	E Cap	
C78	QCF31HP-103	C Cap	
C79	QEK61HM-105	E Cap	
C80	QCS31HJ-470	C Cap	
C81	QCF31HP-223	C Cap	
C82	QCF31HP-223	C Cap	
C83	QCF31HP-223	C Cap	
C84	QCF31HP-223	C Cap	
C85	QCF31HP-223	C Cap	
C86	QCF31HP-223	C Cap	
C87	QEK60JM-336	E Cap	
C88	QCF31HP-223	C Cap	
C89	QCF31HP-103	C Cap	

Symbol No.	Part No.	Part Name	Description
C90	QCF31HP-103	C Cap	
C91	QCS31HJ-121	C Cap	
C92	QCS41HJ-121	C Cap	
C93	QCF31HP-223	C Cap	
C94	QCF31HP-103	C Cap	
C95	PU51163-181	C Cap	180pF
C96	QCT25CH-390	C Cap	
C97	QET60JM-107	E Cap	
C98	QCS31HJ-100	C Cap	
C99	QCF31HP-223	C Cap	
C100	QEN61CM-106	NP Cap	
C101	QCS31HJ-221	C Cap	
C102	QET61EM-475	E Cap	
C103	QCS31HJ-121	C Cap	
C104	PU51163-391	C Cap	
C105	QEK61HM-474	E Cap	
C106	QCS31HJ-331	C Cap	
C107	QCF31HP-103	C Cap	
C108	QET61HM-105	E Cap	
C109	QET61HM-335	E Cap	
C110	QET60JM-227	E Cap	
C111	QET61EM-475	E Cap	
C112	QET61CM-106	E Cap	
C113	QET61CM-106	E Cap	
C114	QET60JM-336	E Cap	
C115	QET60JM-476	E Cap	
C116	QCS31HJ-270	C Cap	
C117	QCS31HJ-820	C Cap	
C118	QET60JM-476	E Cap	
C119	QCS31HJ-270	C Cap	
C120	QCF31HP-223	C Cap	
C121	QET61CM-106	E Cap	
C122	QEK61HM-104	E Cap	
C123	QET61HM-474	E Cap	
C124	QCF31HP-103	C Cap	
C125	QFN31HJ-104	MY Cap	
C126	QET61HM-105	E Cap	
C127	-	-	
C128	-	-	
C129	-	-	
C130	-	-	
C131	-	-	
C132	-	-	
C133	QET60JM-476	E Cap	
C134	PU51163-271	C Cap	270pF
C135	QCF31HP-223	C Cap	
C136	QCS31HJ-180	C Cap	
C137	QCS31HJ-680	C Cap	
C138	-	-	
C139	QCS31HJ-181	C Cap	
C140	QEN61AM-336	NP Cap	
C141	QCS31HJ-560	C Cap	
C142	-	-	
C143	QCS31HJ-390	C Cap	
C144	QCS31HJ-8R0	C Cap	
C145	QCS31HJ-560	C Cap	
C146	QET61AM-476	E Cap	
C147	QCF31HP-223	C Cap	
C148	QET61HM-105	E Cap	
C149	QCF31HP-223	C Cap	
C150	QET61HM-105	E Cap	
C151	QET61CM-106	E Cap	
C152	QCF31HP-223	C Cap	
C153	QCF31HP-223	C Cap	

Symbol No.	Part No.	Part Name	Description
C154	QCF31HP-223	C Cap	
C155	QET60JM-476	E Cap	
C156	QCF31HP-223	C Cap	
C157	QFN31HJ-272	MY Cap	
C158	QCS31HJ-331	C Cap	
C159	QEK40JM-476	E Cap	
C160	QET61HM-105	E Cap	
C161	QET61AM-107	E Cap	
C162	QCF31HP-223	C Cap	
C163	QET60JM-108	E Cap	
C164	QCS31HJ-8R0	C Cap	
C165	QET61HM-105	E Cap	
C166	QET60JM-336	E Cap	
C167	QCF31HP-223	C Cap	
C168	QEN61HM-105	NP Cap	
C169	QET60JM-476	E Cap	
C170	QET60JM-476	E Cap	
C171	QCX11EM-153	C Cap	
C172	QET61CM-106	E Cap	
C173	QCS41HJ-150	C Cap	
C174	QCF31HP-103	C Cap	
C175	QCX11EM-103	C Cap	
C176	QET61HM-225	E Cap	
C177	QCX11EM-103	C Cap	
C178	QET60JM-476	E Cap	
C179	QCS31HJ-221	C Cap	
C180	QCX11EM-103	C Cap	
C181	QET60JM-476	E Cap	
C182	QCS31HJ-470	C Cap	
C183	QET61AM-336	E Cap	
C184	QET61CM-106	E Cap	
C185	QET61AM-336	E Cap	
C186	-	-	
C187	QET60JM-107	E Cap	
C188	QCS31HJ-7R0	C Cap	
C189	QCS31HJ-100	C Cap	
C190	QCX11EM-153	C Cap	
C191	QCS11HJ-750	C Cap	
C192	QCS31HJ-181	C Cap	
C193	QCS31HJ-220	C Cap	
C194	QFN31HJ-563	MY Cap	
C195	QCS31HJ-820	C Cap	
L1	79V25359	Peaking Coil	
L2	79V25359	Peaking Coil	
L3	79V21596	Peaking Coil	
L4	79V29672	Peaking Coil	
L5	79V29673	Peaking Coil	
L6	79V23375	Peaking Coil	
L7	79V21596	Peaking Coil	
L8	79V21596	Peaking Coil	
L9	79V21596	Peaking Coil	
L10	79V25357	Peaking Coil	

Symbol No.	Part No.	Part Name	Description
L11	79V23378	Peaking Coil	
L12	79V29674	Peaking Coil	
L13	79V23374	Peaking Coil	
L14	79V21595	Peaking Coil	
L15	79V21596	Peaking Coil	
L16	79V23374	Peaking Coil	
L17	79V21596	Peaking Coil	
L18	79V21596	Peaking Coil	
L19	79V23374	Peaking Coil	
L20	79V23377	Peaking Coil	
L21	79V21597	Peaking Coil	
L22	79V29675	Peaking Coil	
L23	79V21596	Peaking Coil	
L24	79V21596	Peaking Coil	
L25	79V21596	Peaking Coil	
L26	79V21595	Peaking Coil	
L27	79V21596	Peaking Coil	
L28	79V21595	Peaking Coil	
L29	79V25361	Peaking Coil	
L30	79V25358	Peaking Coil	
L31	79V21595	Peaking Coil	
L32	79V21596	Peaking Coil	
L33	79V25361	Peaking Coil	
L34	79V25361	Peaking Coil	
L35	79V21596	Peaking Coil	
L36	-	-	
L37	-	-	
L38	79V21596	Peaking Coil	
L39	79V21601	Peaking Coil	
L40	79V23378	Peaking Coil	
L41	79V25360	Peaking Coil	
L42	79V29676	Peaking Coil	
L43	79V23378	Peaking Coil	
L44	79V21596	Peaking Coil	
L45	79V29072	Peaking Coil	
L46	79V21596	Peaking Coil	
L47	79V21596	Peaking Coil	
L48	79V21596	Peaking Coil	
L49	79V27449	Peaking Coil	
L50	79V21598	Peaking Coil	
LPF1	79V24016	Low Pass Filtter	
LPF2	79V29677	Low Pass Filtter	
CF1	79V29678	Ceramic Filter	500 kHz
⚠ CP1	79V20458	IC Protector	
EQ1	79V29679	Equalizer	
EQ2	79V29680	Equalizer	
EQ3	79V29681	Equalizer	
EQ4	79V29124	Equalizer	
RY1	79V29682	Relay	
	79V20937	Test Pin	TP3, 4, 6, 10–12, 21–27, GND

Symbol No.	Part No.	Part Name	Description
CN1	79V29037	Cap. Housing	
CN2	-	-	
CN3	79V29040	Cap. Housing	
CN4	79V29038	Cap. Housing	
CN5	79V29032	Cap. Housing	
CN6	79V29036	Cap. Housing	
CN7	79V26052	Cap. Housing	
CN8	79V29032	Cap. Housing	
CN9	-	-	
CN10	79V29041	Cap. Housing	
CN11	79V23383	Cap. Housing	
CN12	79V29039	Cap. Housing	
CN13	79V29035	Cap. Housing	

Symbol No.	Part No.	Part Name	Description
[COLOUR Section]			
IC401	79V29683	IC, HA11756	
IC402	79V22001	IC, BA7007	
IC403	79V27113	IC, BA7021	
⚠ IC404	79V29684	IC, TL87059	
IC405	79V29685	IC, AN3592K	
IC406	79V20326	IC, AN6342N	
Q401	79V23097	TR, 2SC2021S	
Q402	79V23097	TR, 2SC2021S	
Q403	79V29686	TR, 2SC2636R	
Q404	79V23097	TR, 2SC2021S	
Q405	-	-	
Q406	79V23502	TR, 2SC2021Q, R	
Q407	79V23502	TR, 2SC2021Q, R	
Q408	79V23502	TR, 2SC2021Q, R	
Q409	79V29659	TR, DTC144EF	
Q410	79V23502	TR, 2SC2021Q, R	
Q411	79V29659	TR, DTC144EF	
Q412	79V29659	TR, DTC144EF	
Q413	79V29659	TR, DTC144EF	
Q414	79V29659	TR, DTC144EF	
Q415	79V29659	TR, DTC144EF	
Q416	79V23502	TR, 2SC2021Q, R	
Q417	79V29659	TR, DTC144EF	
Q418	79V20192	TR, 2SC2647B, C	
Q419	79V29686	TR, 2SC2636R	
Q420	79V29686	TR, 2SC2636R	
Q421	79V20192	TR, 2SC2647B, C	
Q422	79V20192	TR, 2SC2647B, C	
Q423	79V20192	TR, 2SC2647B, C	
Q424	79V29659	TR, DTC144EF	
Q425	79V23502	TR, 2SC2021Q, R	
Q426	79V23502	TR, 2SC2021Q, R	
Q427	79V29687	TR, 2SB641Q, R	
Q428	79V23502	TR, 2SC2021Q, R	
Q429	79V23502	TR, 2SC2021Q, R	
Q430	79V23502	TR, 2SC2021Q, R	
Q431	79V23502	TR, 2SC2021Q, R	
Q432	79V23502	TR, 2SC2021Q, R	
Q433	79V29659	TR, DTC144EF	
Q434	79V29659	TR, DTC144EF	
Q435	79V21143	TR, 2SC2655O, Y	
Q436	79V29659	TR, DTC144EF	
D401	79V20173	Diode, 1SS133	
D402	79V20173	Diode, 1SS133	
D403	79V20173	Diode, 1SS133	
D404	79V20173	Diode, 1SS133	
D405	79V20173	Diode, 1SS133	

Symbol No.	Part No.	Part Name	Description
D406	79V20173	Diode 1SS133	
D407	79V20173	Diode 1SS133	
D408	79V20173	Diode 1SS133	
D409	79V20173	Diode 1SS133	
D410	79V20173	Diode 1SS133	
D411	79V20173	Diode 1SS133	
D412	79V20173	Diode 1SS133	
D413	79V20173	Diode 1SS133	
D414	79V20173	Diode 1SS133	
D415	79V20173	Diode 1SS133	
D416	79V20173	Diode 1SS133	
D417	79V20173	Diode 1SS133	
D418	79V20173	Diode 1SS133	
D419	79V20173	Diode 1SS133	
D420	79V20173	Diode 1SS133	
D421	79V20173	Diode 1SS133	
D422	79V20173	Diode 1SS133	
D423	79V20173	Diode 1SS133	
R401	QRD161J-223	CR	
R402	QRD161J-223	CR	
R403	QRD161J-680	CR	
R404	QRD161J-390	CR	
R405	QRD161J-333	CR	
R406	QRD161J-123	CR	
R407	QRD161J-222	CR	
R408	QRD161J-471	CR	
R409	QRD161J-473	CR	
R410	QRD161J-183	CR	
R411	QRD161J-122	CR	
R412	QRD161J-471	CR	
R413	QRD161J-820	CR	
R414	QRD161J-121	CR	
R415	QRD161J-681	CR	
R416	QRD161J-102	CR	
R417	QRD161J-102	CR	
R418	QRD161J-332	CR	
R419	QRD161J-332	CR	
R420	QRD161J-393	CR	
R421	QRD161J-102	CR	
R422	QRD161J-102	CR	
R423	QRD161J-103	CR	
R424	QRD161J-104	CR	
R425	QRD161J-102	CR	
R426	QRD161J-153	CR	
R427	QRD161J-122	CR	
R428	QRD161J-122	CR	
R429	QRD161J-152	CR	
R430	QRD161J-473	CR	
R431	QRD161J-221	CR	
R432	QRD161J-103	CR	
R433	QRD161J-102	CR	
R434	QRD161J-183	CR	
R435	QRD161J-683	CR	
R436	QRD161J-182	CR	
R437	79V29664	VR	
R438	QRD161J-103	CR	
R439	QRD161J-333	CR	
R440	QRD161J-103	CR	
R441	QRD161J-562	CR	

Symbol No.	Part No.	Part Name	Description
R442	-	-	
R443	QRD161J-103	CR	
R444	QRD161J-333	CR	
R445	QRD161J-183	CR	
R446	QRD161J-682	CR	
R447	QRD161J-562	CR	
R448	QRD161J-152	CR	
R449	QRD161J-472	CR	
R450	QRD161J-102	CR	
R451	QRD161J-223	CR	
R452	QRD161J-472	CR	
R453	QRD161J-222	CR	
R454	QRD161J-222	CR	
R455	QRD161J-123	CR	
R456	QRD161J-123	CR	
R457	QRD161J-473	CR	
R458	QRD161J-274	CR	
R459	79V29671	VR	CONV. BAL.
R460	QRD161J-103	CR	
R461	79V29671	VR	VXO
R462	QRD161J-274	CR	
R463	QRD161J-472	CR	
R464	QRD161J-332	CR	
R465	79V29666	VR	AFC
R466	QRD161J-681	CR	
R467	QRD161J-102	CR	
R468	QRD161J-102	CR	
R469	QRD161J-473	CR	
R470	QRD161J-472	CR	
R471	QRD161J-103	CR	
R472	QRD161J-473	CR	
R473	QRD161J-473	CR	
R474	QRD161J-222	CR	
R475	QRD161J-223	CR	
R476	QRD161J-682	CR	
R477	QRD161J-152	CR	
R478	QRD161J-102	CR	
R479	QRD161J-333	CR	
R480	QRD161J-153	CR	
R481	QRD161J-561	CR	
R482	QRD161J-221	CR	
R483	QRD161J-331	CR	
R484	QRD161J-473	CR	
R485	QRD161J-473	CR	
R486	QRD161J-471	CR	
R487	QRD161J-471	CR	
R488	QRD161J-393	CR	
R489	QRD161J-223	CR	
R490	QRD161J-561	CR	
R491	QRD161J-561	CR	
R492	QRD161J-222	CR	
R493	QRD161J-822	CR	
R494	QRD161J-103	CR	
R495	QRD161J-152	CR	
R496	79V29666	VR	0.5 H DELAY
R497	QRD161J-473	CR	
R498	QRD161J-393	CR	
R499	QRD161J-222	CR	
R500	QRD161J-103	CR	
R501	QRD161J-102	CR	
R502	QRD161J-122	CR	
R503	QRD161J-682	CR	
R504	QRD161J-223	CR	
R505	QRD161J-471	CR	

Symbol No.	Part No.	Part Name	Description
R506	QRD161J-681	CR	
R507	QRD161J-681	CR	
R508	QRD161J-331	CR	
R509	QRD161J-221	CR	
R510	QRD161J-222	CR	
R511	QRD161J-103	CR	
R512	QRD161J-103	CR	
R513	QRD161J-391	CR	
R514	QRD161J-123	CR	
R515	QRD161J-104	CR	
R516	-	-	
R517	QRD161J-473	CR	
R518	QRD161J-473	CR	
R519	QRD161J-473	CR	
R520	QRD161J-821	CR	
R521	QRD161J-272	CR	
R522	QRD161J-222	CR	
R523	79V29688	VR	DELAY COLOUR
R524	QRD161J-393	CR	
R525	79V29662	VR	0.5 H DET.
R526	QRD161J-221	CR	
R527	QRD161J-154	CR	
R528	QRD161J-103	CR	
R529	QRD161J-223	CR	
R530	-	-	
R531	QRD161J-102	CR	
R532	QRD161J-154	CR	
R533	-	-	
R534	QRD161J-682	CR	
R535	QRD161J-562	CR	
R536	QRD161J-151	CR	
R537	QRD161J-223	CR	
R538	QRD161J-154	CR	
R539	-	-	
⚠ R540	79V29689	OMR	
R541	-	-	
R542	QRD161J-272	CR	
R543	QRD161J-104	CR	
C401	QCF31HP-223	C Cap	
C402	QET60JM-107	E Cap	
C403	QCF31HP-103	C Cap	
C404	QCF31HP-103	C Cap	
C405	QCS31HJ-221	C Cap	
C406	QCS31HJ-120	C Cap	
C407	QCF31HP-103	C Cap	
C408	QCF31HP-103	C Cap	
C409	-	-	
C410	QCF31HP-103	C Cap	
C411	QEE51VM-684	T Cap	
C412	QFN31HJ-102	MY Cap	
C413	QCS31HJ-101	C Cap	
C414	QFN31HJ-473	MY Cap	
C415	QET61EM-475	E Cap	
C416	QCF31HP-103	C Cap	

Symbol No.	Part No.	Part Name	Description
C417	QET61EM-475	E Cap	
C418	QCF31HP-223	C Cap	
C419	QCF31HP-103	C Cap	
C420	QCF31HP-223	C Cap	
C421	QCF31HP-223	C Cap	
C422	QET60JM-107	E Cap	
C423	QET61AM-226	E Cap	
C424	QCF31HP-223	C Cap	
C425	QCS31HJ-101	C Cap	
C426	QCF31HP-103	C Cap	
C427	QCF31HP-103	C Cap	
C428	QCF31HP-223	C Cap	
C429	QCF31HP-223	C Cap	
C430	QET61HM-225	E Cap	
C431	-	-	
C432	-	-	
C433	QFN31HJ-472	MY Cap	
C434	QET60JM-107	E Cap	
C435	QCF31HP-223	C Cap	
C436	QFN31HJ-223	MY Cap	
C437	QET61HM-105	E Cap	
C438	QEE41AM-685	T Cap	
C439	QFN31HJ-683	MY Cap	
C440	QFN31HJ-563	MY Cap	
C441	QFN31HJ-333	MY Cap	
C442	QCT25CH-180	C Cap	
C443	QCT25CH-180	C Cap	
C444	QCX11EM-103	C Cap	
C445	QCS31HJ-470	C Cap	
C446	QET61AM-107	E Cap	
C447	QCF31HP-223	C Cap	
C448	QET61AM-476	E Cap	
C449	QCF31HP-223	C Cap	
C450	QET61AM-336	E Cap	
C451	-	-	
C452	QFN31HJ-182	MY Cap	
C453	QFN31HJ-272	MY Cap	
C454	QFN31HJ-104	MY Cap	
C455	QFN31HJ-103	MY Cap	
C456	QFN31HJ-473	MY Cap	
C457	QET61CM-106	E Cap	
C458	QCF31HP-103	C Cap	
C459	-	-	
C460	QCF31HP-103	C Cap	
C461	QET61HM-105	E Cap	
C462	QET61AM-107	E Cap	
C463	QCF31HP-223	C Cap	
C464	QET60JM-107	E Cap	
C465	QCF31HP-223	C Cap	
C466	QCF31HP-103	C Cap	
C467	QCS31HJ-121	C Cap	
C468	QCS31HJ-101	C Cap	
C469	QCS31HJ-121	C Cap	
C470	QCS31HJ-151	C Cap	
C471	QET60JM-107	E Cap	
C472	QCF31HP-223	C Cap	
C473	QCS31HJ-560	C Cap	
C474	QCS31HJ-560	C Cap	
C475	QCF31HP-103	C Cap	
C476	QCS31HJ-680	C Cap	
C477	QCF31HP-103	C Cap	
C478	QCF11HP-223	C Cap	
C479	QET61HM-104	E Cap	
C480	QET60JM-107	E Cap	

Symbol No.	Part No.	Part Name	Description
C481	QCF31HP-223	C Cap	
C482	QCX11EM-103	C Cap	
C483	QER41AM-476	E Cap	
C484	QER41HM-105	E Cap	
C485	QER41EM-475	E Cap	
C486	QCX11EM-103	C Cap	
C487	QCF11HP-103	C Cap	
C488	QET61CM-106	E Cap	
C489	QEK61HM-104	E Cap	
C490	QET61AM-107	E Cap	
C491	QCF31HP-223	C Cap	
C492	QCF31HP-223	C Cap	
C493	QET61AM-107	E Cap	
C494	QCS31HJ-270	C Cap	
C495	QET60JM-476	E Cap	
C496	QCS31HJ-820	C Cap	
C497	QFN31HJ-332	MY Cap	
C498	QFN31HJ-152	MY Cap	
C499	QET61EM-475	E Cap	
C500	-	-	
C501	QET61HM-105	E Cap	
C502	QET61HM-105	E Cap	
C503	QCF31HP-103	C Cap	
C504	QCF31HP-103	C Cap	
C505	QCS31HJ-220	C Cap	
C506	QCS31HJ-220	C Cap	
C507	QCF31HP-103	C Cap	
C508	QET61HM-105	E Cap	
C509	QFN31HJ-222	MY Cap	
C510	QFN31HJ-273	MY Cap	
C511	QFN31HJ-103	MY Cap	
C512	QFN31HJ-222	MY Cap	
C513	QCF31HP-223	C Cap	
C514	QET60JM-107	E Cap	
C515	QCF31HP-103	C Cap	
C516	QCX11EM-103	C Cap	
C517	QCF31HP-103	C Cap	
C518	QCS31HJ-470	C Cap	
C519	QCF31HP-223	C Cap	
C520	QET61HM-105	E Cap	
C521	QET61HM-105	E Cap	
C522	QCS31HJ-220	C Cap	
C523	QCS31HJ-680	C Cap	
C524	QFN31HK-563	MY Cap	
C525	QFN31HK-222	MY Cap	
C526	QCF31HP-223	C Cap	
C527	QET61AM-227	E Cap	
C528	QCF11HP-222	C Cap	
C529	QET61HM-225	E Cap	
C530	QCF31HP-223	C Cap	
C531	QCF11HP-102	C Cap	

Symbol No.	Part No.	Part Name	Description
L401	79V21596	Peaking Coil	
L402	79V29690	Peaking Coil	
L403	79V21598	Peaking Coil	
L404	79V21596	Peaking Coil	
L405	79V21596	Peaking Coil	
L406	79V29691	Coil	
L407	79V20247	LC Block	
L408	79V21596	Peaking Coil	
L409	79V29692	Coil	
L410	79V21596	Peaking Coil	
L411	79V21596	Peaking Coil	
L412	79V23372	Peaking Coil	
L413	79V29693	Peaking Coil	
L414	79V23372	Peaking Coil	
L415	79V21596	Peaking Coil	
L416	79V21596	Peaking Coil	
L417	79V21596	Peaking Coil	
L418	79V23379	Peaking Coil	
L419	79V29064	Peaking Coil	
L420	79V20247	LC Block	
L421	79V23376	Peaking Coil	
L422	79V29082	Coil	
L423	79V29694	LC Block	
DL401	79V29695	2H Comb Filter	
⚠ XB401	79V29696	Crystal Oscillator	4.44MHz
⚠ X401	79V21516	Crystal	4.43MHz
CF401	79V29697	Ceramic Filter	4.43MHz
CF402	79V29304	Ceramic Filter	13.3MHz
BPF401	79V29698	Band Pass Filter	
BPF402	79V29699	Band Pass Filter	
LPF401	79V23146	Low Pass Filter	
EQ401	79V30001	Equalizer	
	79V20937	Test Pin	TP401, 403–405, 410, 421, 422, 425–432, GND
	79V29104	Spacer	× 7

NOTE: "× 7" indicates seven pieces.

04 A/S/M BOARD ASSEMBLY............. 79V30047

Symbol No.	Part No.	Part Name	Description
	79V29162	Dust Cover	
	79V30002	Shield Cover(1)	(FR
	79V29170	Shield Cover(2)	(FR
	79V30003	Shield Cover(3)	(FR
	79V30004	Spacer	
	79V29159	Dust Spacer	x 3
	79V30005	Dust Spacer	
	79V29161	Dust Spacer	
	79V30006	Jack Board	
	79V29109	Tapping Screw	x 2
	79V29298	Hinge	x 2
	79V29105	Spacer	x 5
	79V29087	Insulator	
	79V30007	Shield Case	
	79V29148	Headphone Jack	
	79V29149	Mic. Jack	

NOTE: "x 2", "x 3" & "x 5" indicates two, three and five pieces.

[AUDIO Section]

IC1	79V30008	IC, 14VT06A	
IC2	79V20322	IC, 5VT01	
IC3	79V23089	IC, TA7361P	
IC4	79V23072	IC, TA6394	
IC5	79V27181	IC, 14VT07	
IC6	79V27178	IC, 11VT01	
IC7	79V23089	IC, TA7361P	
IC8	79V23072	IC, AN6394	
IC9	79V27181	IC, 14VT07	
IC10	79V27178	IC, 11VT01	
IC11	79V27166	IC, TK15050	
Q1	79V20088	TR, 2SD639R, S	
Q2	79V20088	TR, 2SD639R, S	
Q3	79V20922	TR, 2SB644R, S	
⚠ Q4	79V20922	TR, 2SB644R, S	
⚠ Q5	79V23105	TR, 2SD639S	
⚠ Q6	79V23500	TR, 2SB822R	
⚠ Q7	79V20100	TR, 2SC2021Q, R, S	
Q8	79V30009	TR, DTC124EF	
Q9	79V30009	TR, DTC124EF	
Q10	79V20918	TR, 2SB641R, S	
Q11	79V30009	TR, DTC124EF	
Q12	79V30009	TR, DTC124EF	
Q13	79V20927	TR, 2SD636R, S	
Q14	79V30009	TR, DTA124EF	
Q15	79V30009	TR, DTC124EF	
Q16	79V30009	TR, DTC124EF	
Q17	79V20918	TR, 2SB641R, S	
Q18	79V30009	TR, DTC124EF	
Q19	79V30009	TR, DTC124EF	
Q20	79V20927	TR, 2SD636R, S	
Q21	-	-	
Q22	79V30009	TR, DTC124EF	
Q23	79V20089	TR, 2SB643R, S	

Symbol No.	Part No.	Part Name	Description
D1	79V20173	Diode 1SS133	
D2	79V20173	Diode 1SS133	
D3	79V20173	Diode 1SS133	
D4	79V27175	Diode 1SS132	
D5	79V27175	Diode 1SS132	
D6	79V20084	Zener Diode RD6, 2EB2	
D7	79V27175	Diode 1SS132	
D8	79V27155	Zener Diode RD8, 2EB1	
D9	79V20173	Diode 1SS133	
D10	79V20173	Diode 1SS133	
D11	79V20173	Diode 1SS133	
D12	79V20173	Diode 1SS133	
D13	79V20173	Diode 1SS133	
D14	79V20173	Diode 1SS133	
D15	-	-	
D16	79V20173	Diode 1SS133	
D17	79V20173	Diode 1SS133	
D18	79V20173	Diode 1SS133	
D19	79V20173	Diode 1SS133	
D20	79V20173	Diode 1SS133	
D21	79V20173	Diode 1SS133	
D22	79V20173	Diode 1SS133	
D23	79V20173	Diode 1SS133	
D24	79V20173	Diode 1SS133	
D25	-	-	
D26	-	-	
D27	79V30010	Zener Diode RD3, 3EB2	
D28	79V20173	Diode 1SS133	
D29	79V20173	Diode 1SS133	
R1	QRD161J-182	CR	
R2	QRD161J-222	CR	
R3	QRD161J-124	CR	
R4	QRD161J-560	CR	
R5	QRD181J-475	CR	
R6	QRD161J-472	CR	
R7	QRD161J-223	CR	
R8	QRD161J-472	CR	
⚠ R9	79V30011	FR	
R10	QRD161J-102	CR	
R11	QRD161J-102	CR	
R12	QRD161J-103	CR	
R13	QRD161J-123	CR	
R14	QRD161J-123	CR	
R15	QRD161J-392	CR	
R16	QRD161J-332	CR	
R17	QRD161J-392	CR	
R18	QRD161J-222	CR	
R19	QRD161J-332	CR	
R20	QRD161J-331	CR	
R21	QRD161J-223	CR	
R22	QRD161J-333	CR	
R23	QRD161J-153	CR	
R24	QRD161J-223	CR	
R25	79V29010	VR	CH1 BIAS
R26	QRD161J-393	CR	
R27	QRD161J-473	CR	
R28	QRD161J-123	CR	
R29	QRD161J-103	CR	
R30	QRD161J-103	CR	

Symbol No.	Part No.	Part Name	Description
R31	QRD161J-103	CR	
R32	QRD161J-154	CR	
R33	QRD161J-153	CR	
⚠ R34	79V30012	Posistor	
R35	QRD161J-273	CR	
R36	QRD161J-560	CR	
R37	QRD161J-680	CR	
R38	QRD161J-183	CR	
R39	-	-	
R40	QRD161J-332	CR	
R41	79V30013	VR	CH 1 PB
R42	QRD161J-682	CR	
R43	QRD161J-392	CR	
R44	QRD161J-124	CR	
R45	QRD161J-201	CR	
R46	-	-	
R47	QRD161J-124	CR	
R48	QRD161J-221	CR	
R49	QRD161J-331	CR	
R50	QRD161J-123	CR	
R51	QRD161J-223	CR	
R52	QRD161J-472	CR	
R53	QRD161J-471	CR	
R54	-	-	
R55	QRD161J-152	CR	
R56	79V30014	VR	CH 1 REC
R57	QRD161J-273	CR	
R58	QRD161J-152	CR	
R59	QRD161J-822	CR	
R60	QRD161J-273	CR	
R61	QRD161J-223	CR	
⚠ R62	79V30015	Posistor	
R63	79V29010	VR	CH 2 BIAS
R64	QRD161J-393	CR	
R65	QRD161J-473	CR	
R66	QRD161J-123	CR	
R67	QRD161J-103	CR	
R68	QRD161J-223	CR	
R69	QRD161J-103	CR	
⚠ R70	79V30012	Posistor	
R71	QRD161J-103	CR	
R72	QRD161J-154	CR	
R73	QRD161J-153	CR	
R74	QRD161J-273	CR	
R75	QRD161J-560	CR	
R76	QRD161J-680	CR	
R77	QRD161J-183	CR	
R78	-	-	
R79	QRD161J-332	CR	
R80	79V30013	VR	CH 2 PB
R81	QRD161J-682	CR	
R82	QRD161J-392	CR	
R83	QRD161J-124	CR	
R84	QRD161J-201	CR	
R85	-	-	
R86	QRD161J-124	CR	
R87	QRD161J-221	CR	
R88	QRD161J-331	CR	
R89	QRD161J-123	CR	
R90	QRD161J-223	CR	
R91	QRD161J-472	CR	
R92	QRD161J-471	CR	
R93	QRD161J-822	CR	
R94	79V30014	VR	CH 2 REC

Symbol No.	Part No.	Part Name	Description
R95	QRD161J-273	CR	
R96	QRD161J-152	CR	
R97	-	-	
R98	QRD161J-273	CR	
R99	QRD161J-223	CR	
R100	QRD161J152	CR	
⚠ R101	79V30012	Posistor	
R102	QRD161J-124	CR	
R103	QRD161J-124	CR	
R104	QRD181J-221	CR	
R105	QRD161J-331	CR	
R106	QRD161J-331	CR	
R107	QRD161J-331	CR	
R108	QRD161J-331	CR	
R109	QRD161J-221	CR	
R110	QRD161J-221	CR	
⚠ R111	QRD161J-103	CR	
⚠ R112	QRD161J-272	CR	
R113	QRD161J-222	CR	
⚠ R114	79V30016	Posistor	
⚠ R115	79V30015	Posistor	
R116	QRD161J-103	CR	
R117	QRD161J-103	CR	
R150	79V29012	VR	MIX
C1	QEK61CM-476	E Cap	
C2	QEK61CM-476	E Cap	
C3	QEK41CM-106	E Cap	
C4	QET41CM-107	E Cap	
C5	QEN41EM-475	NP Cap	
C6	QFN31HJ-154	MY Cap	
C7	QFN31HJ-683	MY Cap	
C8	QEN41HM-225	NP Cap	
C9	QEK61CM-106	E Cap	
C10	QFZ9011-224	MP Cap	
C11	QFP42AJ-273	PP Cap	
C12	QCS11HJ-561	C Cap	
C13	-	-	
C14	QET61CM-107	E Cap	
C15	QFN31HJ-333	MY Cap	
C16	QFN31HJ-153	MY Cap	
C17	QFN31HJ-103	MY Cap	
C18	QFN31HJ-103	MY Cap	
C19	QEK61HM-105	E Cap	
C20	QET61CM-107	E Cap	
C21	QFN31HJ-103	MY Cap	
C22	QCS31HJ-561	C Cap	
C23	QCS31HJ-391	C Cap	
C24	QEK61CM-476	E Cap	
C25	QEK61CM-226	E Cap	

Symbol No.	Part No.	Part Name	Description
C26	QEK61EM-475	E Cap	
C27	QFN31HJ-124	MY Cap	
C28	QFN31HJ-683	MY Cap	
C29	QEK61EM-335	E Cap	
C30	QEK61HM-105	E Cap	
C31	QEK61HM-105	E Cap	
C32	QEK61HM-105	E Cap	
C33	QFN31HJ-273	MY Cap	
C34	QFN31HJ-273	MY Cap	
C35	QEK61CM-476	E Cap	
C36	QFN31HJ-102	MY Cap	
C37	QFN31HJ-102	MY Cap	
C38	QEL61HM-105G	LL Cap	
C39	QFN31HJ-683	MY Cap	
C40	QFN31HJ-103	MY Cap	
C41	QFN31HJ-102	MY Cap	
C42	QEK61CM-106	E Cap	
C43	QEK60JM-107	E Cap	
C44	QEK61CM-106	E Cap	
C45	QEK61AM-476	E Cap	
C46	-	-	
C47	QEK61HM-225	E Cap	
C48	QEK61CM-106	E Cap	
C49	QEK61CM-106	E Cap	
C50	QEK61EM-335	E Cap	
C51	-	-	
C52	QFN31HJ-152	MY Cap	
C53	QEK61CM-476	E Cap	
C54	QEK61CM-476	E Cap	
C55	QCS31HJ-561	C Cap	
C56	QCS31HJ-391	C Cap	
C57	QEK61CM-476	E Cap	
C58	QEK61CM-226	E Cap	
C59	QEK61EM-475	E Cap	
C60	QFN31HJ-154	MY Cap	
C61	QFN31HJ-683	MY Cap	
C62	QEK61EM-335	E Cap	
C63	QEK61HM-105	E Cap	
C64	QEK61HM-105	E Cap	
C65	QEK61HM-105	E Cap	
C66	QFN31HJ-273	MY Cap	
C67	QFN31HJ-273	MY Cap	
C68	QEK61CM-476	E Cap	
C69	QFN31HJ-102	MY Cap	
C70	QFN31HJ-102	MY Cap	
C71	QEL61HM-105G	LL Cap	
C72	QFN31HJ-102	MY Cap	
C73	QEK61CM-106	E Cap	
C74	QFN31HJ-683	MY Cap	
C75	QFN31HJ-103	MY Cap	
C76	QEK60JM-107	E Cap	
C77	QEK61CM-106	E Cap	
C78	QEK61AM-476	E Cap	
C79	QEK61CM-106	E Cap	
C80	QEK61HM-225	E Cap	
C81	-	-	
C82	QEK61CM-106	E Cap	
C83	QEK61EM-335	E Cap	
C84	-	-	
C85	QFN31HJ-152	MY Cap	
C86	QEK61CM-476	E Cap	
C87	QEK61CM-476	E Cap	
C88	QEK61EM-475	E Cap	
C89	QEK61EM-475	E Cap	

Symbol No.	Part No.	Part Name	Description
C90	QEN61EM-475	NP Cap	
C91	QEK61CM-476	E Cap	
C92	QEK61EM-475	NP Cap	
C93	QEK61CM-476	E Cap	
C94	-	-	
C95	QER61CM-106	E Cap	
L1	-	-	
L2	79V30017	Peaking Coil	
L3	79V20709	Peaking Coil	
L4	79V29080	Coil	
L5	79V30018	Peaking Coil	
L6	79V29081	Coil	
L7	79V30019	Coil	
L8	79V29081	Coil	
L9	79V30019	Coil	
T1	79V29146	Osc. Trans.	
T2	79V30020	Trap Coil	
T3	79V30020	Trap Coil	
CN1	79V29032	Cap. Housing	
CN2	79V29040	Cap. Housing	
CN3	79V26052	Cap. Housing	
CN4	79V29040	Cap. Housing	
CN5	79V29036	Cap. Housing	
CN6	79V29040	Cap. Housing	
CN7	79V29041	Cap. Housing	
CN8	79V29039	Cap. Housing	
CN9	79V29041	Cap. Housing	
CN10	79V26052	Cap. Housing	
CN11	-	-	
CN12	-	-	
CN13	-	-	
CN14	-	-	
CN15	-	-	
CN16	79V29032	Cap. Housing	
SW1	79V29127	Slide Switch	NR
SW2	79V29128	Slide Switch	AUDIO DUB.
SW3	79V29129	Slide Switch	AUDIO OUT MONITOR
SW4	79V23158	Slide Switch	HEADPHONE LEVEL
SW5	79V29130	Rotary Switch	REC SELECT
RY1	79V26021	Relay	
RY2	79V26021	Relay	
RY3	79V26021	relay	

Symbol No.	Part No.	Part Name	Description
[SERVO Section]			
IC401	79V20033	IC, M51402L	
IC402	79V27116	IC, HA11780	
IC403	79V30021	IC, BA833S	
IC404	79V27108	IC, BA236	
IC405	79V27168	IC, UPC393C	
IC406	79V27129	IC, M5218P	
IC407	79V27168	IC, UPC393C	
IC408	79V27173	IC, UPD4030BC	
IC409	79V30022	IC, M50766-601P	
⚠ IC410	79V30023	IC, M51722P	
IC411	79V27058	IC, UPD4066BC	
IC412	79V27058	IC, UPD4066BC	
IC413	79V30024	IC, UPD1511AC-047	
⚠ IC414	79V24003	IC, BA632S	
IC415	79V23073	IC, BA6302A	
IC416	79V20355	IC, UPC358C	
⚠ IC417	79V20355	IC, UPC358C	
IC418	79V27172	IC, UPD4013BC	
IC419	79V27172	IC, UPD4013BC	
IC420	79V27168	IC, UPC393C	
Q401	79V29658	DTC114EF	
Q402	79V30009	DTA124EF	
Q403	79V30009	DTA124EF	
Q404	79V30009	DTA124EF	
Q405	79V30009	DTA124EF	
Q406	79V30009	DTA124EF	
Q407	79V30009	DTA124EF	
Q408	79V30009	DTA124EF	
Q409	79V30009	DTA124EF	
Q410	79V30009	DTA124EF	
Q411	79V30009	DTA124EF	
Q412	79V30009	DTA124EF	
Q413	79V30009	DTA124EF	
Q414	79V30009	DTA124EF	
Q415	79V20926	DTA124EF	
Q416	79V30009	DTA124EF	
Q417	79V30009	DTA124EF	
Q418	79V30009	DTA124EF	
Q419	79V21137	TR, 2SB641Q, R	
Q420	79V20926	TR, 2SD636Q, R	
Q421	79V21137	TR, 2SB641Q, R	
Q422	79V20926	TR, 2SD636Q, R	
Q423	79V21137	TR, 2SB641Q, R	
Q424	79V20926	TR, 2SD636Q, R	
Q425	79V21137	TR, 2SB641Q, R	
Q426	79V30009	DTC124EF	
Q427	79V30009	DTC124EF	
Q428	79V30009	DTC124EF	
Q429	79V30009	DTC124EF	
Q430	79V20926	TR, 2SD636Q, R	
Q431	79V21137	TR, 2SB641Q, R	
Q432	79V20926	TR, 2SD636Q, R	

Symbol No.	Part No.	Part Name	Description
D401	79V20173	Diode, 1SS133	
D402	79V20173	Diode, 1SS133	
D403	79V20173	Diode, 1SS133	
D404	79V20173	Diode, 1SS133	
D405	79V20173	Diode, 1SS133	
D406	79V20173	Diode, 1SS133	
D407	79V20173	Diode, 1SS133	
D408	79V20173	Diode, 1SS133	
D409	79V20173	Diode, 1SS133	
D410	79V20173	Diode, 1SS133	
D411	79V20173	Diode, 1SS133	
D412	79V20173	Diode, 1SS133	
D413	79V20173	Diode, 1SS133	
D414	79V20173	Diode, 1SS133	
D415	79V20173	Diode, 1SS133	
D416	79V20173	Diode, 1SS133	
D417	79V20173	Diode, 1SS133	
D418	79V20173	Diode, 1SS133	
D419	79V20173	Diode, 1SS133	
D420	79V20173	Diode, 1SS133	
D421	79V20173	Diode, 1SS133	
D422	79V20173	Diode, 1SS133	
D423	79V20173	Diode, 1SS133	
D424	79V20173	Diode, 1SS133	
D425	79V20173	Diode, 1SS133	
D426	79V20173	Diode, 1SS133	
D427	79V20173	Diode, 1SS133	
D428	79V20173	Diode, 1SS133	
D429	79V20173	Diode, 1SS133	
D430	79V20173	Diode, 1SS133	
D431	79V20173	Diode, 1SS133	
D432	79V20173	Diode, 1SS133	
D433	79V20173	Diode, 1SS133	
D434	79V20173	Diode, 1SS133	
D435	79V20173	Diode, 1SS133	
D436	79V20173	Diode, 1SS133	
D437	79V20173	Diode, 1SS133	
D438	79V20173	Diode, 1SS133	
D439	79V20173	Diode, 1SS133	
D440	79V20173	Diode, 1SS133	
D441	79V20173	Diode, 1SS133	
D442	79V20173	Diode, 1SS133	
D443	79V20173	Diode, 1SS133	
D444	79V20173	Diode, 1SS133	
D445	79V20173	Diode, 1SS133	
D446	79V20173	Diode, 1SS133	
D447	79V20173	Diode, 1SS133	
D448	79V20173	Diode, 1SS133	
D449	79V20173	Diode, 1SS133	
D450	79V20173	Diode, 1SS133	
D451	79V20173	Diode, 1SS133	
D452	79V20173	Diode, 1SS133	
D453	79V20173	Diode, 1SS133	
D454	–	–	
D455	79V20173	Diode, 1SS133	
D456	79V20173	Diode, 1SS133	
D457	79V20173	Diode, 1SS133	
D458	79V20173	Diode, 1SS133	
D459	79V20173	Diode, 1SS133	
D460	–	–	
D461	79V20173	Diode, 1SS133	
D462	79V20173	Diode, 1SS133	
D463	79V20173	Diode, 1SS133	
D464	79V20173	Diode, 1SS133	

Symbol No.	Part No.	Part Name	Description
D465	79V20173	Diode, 1SS133	
D466	79V20173	Diode, 1SS133	
D467	79V20173	Diode, 1SS133	
D468	79V20173	Diode, 1SS133	
D469	79V20173	Diode, 1SS133	
D470	79V20173	Diode, 1SS133	
R401	QRD161J-152	CR	
R402	QRD161J-102	CR	
R403	QRD161J-101	CR	
R404	QRD161J-223	CR	
R405	QRD161J-224	CR	
R406	QRD161J-332	CR	
R407	QRD161J-331	CR	
R408	QRD161J-102	CR	
R409	QRD161J-104	CR	
R410	79V21107	VR	V. LOCK
R411	QRD161J-103	CR	
R412	QRD161J-124	CR	
R413	QRD161J-104	CR	
R414	79V30025	VR	DRUMP U. PULSE
R415	79V30026	VR	CH 1 SW
R416	QRD161J-184	CR	
R417	79V30026	VR	CH 2 SW
R418	QRD161J-184	CR	
R419	QRD161J-683	CR	
R420	QRD161J-563	CR	
R421	QRD161J-123	CR	
R422	QRD161J-102	CR	
R423	QRD161J-103	CR	
R424	QRD161J-224	CR	
R425	QRD161J-103	CR	
R426	QRD161J-103	CR	
R427	QRD161J-333	CR	
R428	QRD161J-333	CR	
R429	QRD161J-104	CR	
R430	79V30027	VR	REC SW
R431	QRD161J-104	CR	
R432	QRD161J-105	CR	
R433	QRD161J-104	CR	
R434	QRD161J-394	CR	
R435	79V30028	VR	TRACKING PRESET
R436	QRD161J-333	CR	
R437	QRD161J-273	CR	
R438	79V29016	VR	TRACKING
R439	QRD161J-472	CR	
R440	QRD161J-334	CR	
R441	QRD161J-473	CR	
R442	QRD161J-104	CR	
R443	QRD161J-334	CR	
R444	QRD161J-394	CR	
R445	QRD161J-184	CR	
R446	QRD161J-824	CR	
R447	79V30029	VR	LP FWD X3 PRESET
R448	79V30029	VR	LP REV X1 PRESET

Symbol No.	Part No.	Part Name	Description
R449	79V30030	VR	SP SLOW TRACKING (FWD)
R450	79V30030	VR	SP SLOW TRACKING (REV)
R451	79V30031	VR	LP SLOW TRACKING (FWD)
R452	79V30032	VR	LP SLOW TRACKING (REV)
R453	79V29020	VR	SLOW TRACKING
R454	QRD161J-123	CR	
R455	QRD161J-123	CR	
R456	QRD161J-104	CR	
R457	QRD161J-394	CR	
R458	QRD161J-822	CR	
R459	QRD161J-105	CR	
R460	QRD161J-105	CR	
R461	QRD161J-103	CR	
R462	QRD161J-473	CR	
R463	QRD161J-274	CR	
R464	QRD161J-274	CR	
R465	QRD161J-103	CR	
R466	QRD161J-105	CR	
R467	QRD161J-105	CR	
R468	QRD161J-393	CR	
R469	QRD161J-103	CR	
R470	QRD161J-103	CR	
R471	QRD161J-105	CR	
R472	QRD161J-105	CR	
R473	QRD161J-393	CR	
R474	QRD161J-473	CR	
R475	QRD161J-103	CR	
R476	QRD161J-564	CR	
R477	QRD161J-103	CR	
R478	QRD161J-103	CR	
R479	QRD161J-473	CR	
R480	QRD161J-103	CR	
R481	QRD161J-564	CR	
R482	QRD161J-473	CR	
R483	QRD161J-473	CR	
R484	QRD161J-103	CR	
R485	QRD161J-823	CR	
R486	QRD161J-223	CR	
R487	QRD161J-103	CR	
R488	QRD161J-103	CR	
R489	QRD161J-103	CR	
R490	QRD161J-564	CR	
R491	–	–	
R492	QRD161J-472	CR	
R493	QRD161J-333	CR	
R494	QRD161J-394	CR	
R495	QRD161J-103	CR	
R496	QRD161J-683	CR	
R497	QRD161J-105	CR	
R498	QRD161J-822	CR	
R499	QRD161J-103	CR	
R500	QRD161J-103	CR	
R501	QRD161J-105	CR	
R502	QRD161J-102	CR	
R503	QRD161J-473	CR	

Symbol No.	Part No.	Part Name	Description
R504	QRD161J-273	CR	
R505	79V29010	VR	CAP. DISCRI.
R506	QRD161J-154	CR	
R507	QRD161J-333	CR	
R508	QRD161J-473	CR	
R509	QRD161J-824	CR	
R510	QRD161J-474	CR	
R511	QRD161J-333	CR	
R512	QRD161J-152	CR	
R513	QRD161J-472	CR	
R514	QRD161J-272	CR	
R515	QRD161J-472	CR	
R516	QRD161J-472	CR	
R517	–	–	
R518	QRD161J-103	CR	
R519	QRD161J-824	CR	
R520	QRD161J-474	CR	
R521	QRD161J-224	CR	
R522	QRD161J-274	CR	
R523	QRD161J-563	CR	
R524	QRD161J-473	CR	
R525	QRD161J-473	CR	
R526	QRD161J-563	CR	
R527	QRD161J-394	CR	
R528	QRD161J-394	CR	
R529	QRD161J-563	CR	
R530	QRD161J-473	CR	
R531	QRD161J-473	CR	
R532	QRD161J-563	CR	
R533	QRD161J-273	CR	
R534	QRD161J-472	CR	
R535	QRD161J-472	CR	
R536	QRD161J-104	CR	
R537	QRD161J-183	CR	
R538	QRD161J-223	CR	
R539	QRD161J-103	CR	
R540	QRD161J-103	CR	
R541	QRD161J-103	CR	
R542	QRD161J-473	CR	
R543	QRD161J-333	CR	
R544	QRD161J-393	CR	
R545	QRD161J-393	CR	
R546	QRD161J-101	CR	
R547	QRD161J-103	CR	
R548	QRD161J-682	CR	
R549	QRD161J-682	CR	
R550	QRD161J-472	CR	
R551	QRD161J-104	CR	
R552	QRD161J-183	CR	
R553	79V30034	VR	[illegible] DISCR.
R554	QRD161J-183	CR	
R555	QRD161J-223	CR	
R556	79V30035	VR	DRUM DISCR.
R557	QRD161J-184	CR	
R558	QRD161J-563	CR	
R559	QRD161J-153	CR	
R560	QRD161J-183	CR	
R561	QRD161J-103	CR	
R562	QRD161J-564	CR	
R563	QRD161J-333	CR	
R564	QRD161J-392	CR	
R565	QRD161J-103	CR	
R566	QRD161J-103	CR	
R567	QRD161J-104	CR	

Symbol No.	Part No.	Part Name	Description
R568	QRD161J-105	CR	
R569	QRD161J-103	CR	
R570	QRD161J-105	CR	
R571	QRD161J-223	CR	
R572	QRD161J-564	CR	
R573	QRD161J-563	CR	
R574	QRD161J-563	CR	
R575	QRD161J-103	CR	
R576	QRD161J-472	CR	
R577	QRD161J-123	CR	
R578	QRD161J-103	CR	
R579	QRD161J-682	CR	
R580	QRD161J-223	CR	
R581	–	–	
R582	–	–	
R583	QRD161J-103	CR	
R584	QRD161J-682	CR	
R585	QRD161J-823	CR	
R586	QRD161J-562	CR	
R587	QRD161J-123	CR	
R588	QRD161J-472	CR	
R589	QRD161J-223	CR	
R590	QRD161J-123	CR	
R591	QRD161J-103	CR	
R592	–	–	
R593	QRD161J-103	CR	
R594	QRD161J-103	CR	
R595	QRD161J-103	CR	
R596	QRD161J-100	CR	
R597	QRD161J-103	CR	
R598	QRD161J-393	CR	
R599	QRD161J-222	CR	
R600	QRD161J-222	CR	
R601	QRD161J-100	CR	
R602	QRD161J-393	CR	
R603	QRD161J-103	CR	
R604	QRD161J-103	CR	
R605	QRD161J-103	CR	
R606	QRD161J-472	CR	
R607	–	–	
R608	QRD161J-824	CR	
R609	QRD161J-473	CR	
R610	QRD161J-332	CR	
R611	QRD161J-332	CR	
R612	QRD161J-101	CR	
R613	79V30035	Thermistor	
R614	QRD161J-102	CR	
R615	QRD161J-332	CR	
R702	QRD161J-562	CR	
R703	QRD161J-562	CR	
RA401	79V20037	Resistor Array	

Symbol No.	Part No.	Part Name	Description
C401	QEK61CM-226	E Cap	
C402	QET61CM-226	E Cap	
C403	QFN31HK-102	MY Cap	
C404	QET61CM-476	E Cap	
C405	QCS31HJ-221	C Cap	
C406	QFN31HK-103	MY Cap	
C407	QET61CM-106	E Cap	
C408	QET61CM-106	E Cap	
C409	QFN31HJ-332	MY Cap	
C410	QFN31HJ-122	MY Cap	
C411	QFN31HJ-222	MY Cap	
C412	QFN31HJ-222	MY Cap	
C413	QEK61HM-105	E Cap	
C414	QFN31HK-103	MY Cap	
C415	QFN31HK-103	MY Cap	
C416	QFN31HK-103	MY Cap	
C417	QFN31HK-272	MY Cap	
C418	QEK61CM-476	E Cap	
C419	QEK61CM-106	E Cap	
C420	QEB41CM-106	LL Cap	
C421	QEB41CM-106	LL Cap	
C422	QEB41CM-106	LL Cap	
C423	QEB41CM-106	LL Cap	
C424	QFN31HJ-333	MY Cap	
C425	QFN31HK-333	MY Cap	
C426	QCS31HJ-331	C Cap	
C427	QFN31HJ-223	MY Cap	
C428	QCS31HJ-471	C Cap	
C429	QFN41HK-102	MY Cap	
C430	QFN41HJ-104	MY Cap	
C431	QET61CM-226	E Cap	
C432	QFN31HK-104	MY Cap	
C433	QFN31HJ-683	MY Cap	
C434	QFN31HJ-333	MY Cap	
C435	QFN31HK-473	MY Cap	
C436	QCS31HJ-331	C Cap	
C437	QFN31HK-102	MY Cap	
C438	QEN61HM-105	NP Cap	
C439	QFN31HK-104	MY Cap	
C440	QFN31HJ-473	MY Cap	
C441	QFN31HJ-563	MY Cap	
C442	QFN31HJ-104	MY Cap	
C443	QFN31HK-473	MY Cap	
C444	QET61HM-106	E Cap	
C445	QFN31HK-222	MY Cap	
C446	QFN31HK-103	MY Cap	
C447	QFN31HK-102	MY Cap	
C448	QFN31HK-103	MY Cap	
C449	QET61CM-106	E Cap	
C450	QFN31HK-124	MY Cap	
C451	QFN31HK-124	MY Cap	
C452	QET61AM-476	E Cap	
C453	QET61CM-106	E Cap	
C454	QET61CM-106	E Cap	
C455	QET41CM-106	E Cap	
C456	QCF31HP-103	C Cap	
C457	QFN31HK-103	MY Cap	
C458	QET41HM-105	E Cap	
C459	QET41HM-105	E Cap	
C460	-	-	
C461	QFN31HK-223	MY Cap	
C462	QFN31HK-102	MY Cap	
C463	QET61CM-226	E Cap	
C464	QEK41CM-106	E Cap	

Symbol No.	Part No.	Part Name	Description
C465	-	-	
C466	QCS31HJ-271	C Cap	
C467	QEK41HM-105	E Cap	
C468	QEK41CM-106	E Cap	
C469	QFN31HK-823	MY Cap	
C470	QFN31HJ-153	MY Cap	
C471	QEN61HM-105	NP Cap	
C472	QEN61HM-105	NP Cap	
C473	QEN61HM-105	NP Cap	
C474	QEN61HM-105	NP Cap	
C475	QEK61CM-106	E Cap	
C476	QCS31HJ-680	C Cap	
C477	QCS31HJ-680	C Cap	
C478	QFN31HK-223	MY Cap	
C479	QFN31HK-223	MY Cap	
C480	QET61CM-106	E Cap	
C481	QFN31HK-102	MY Cap	
C482	-	-	
C483	QFP42AJ-272	PP Cap	
C484	QFP42AJ-392	PP Cap	
C485	-	-	
C486	QFN31HJ-103	MY Cap	
C487	QET61CM-106	E CaP	
C488	QFN31HK-682	MY Cap	
C489	QCS31HJ-101	C Cap	
C490	QEK61CM-336	E Cap	
C491	QFN31HK-393	MY Cap	
C492	QFN31HK-683	MY Cap	
C493	QEN61CM-106	NP Cap	
C494	QEN41HM-474	NP Cap	
C495	QFN31HK-222	MY Cap	
C496	QEN61CM-106	NP Cap	
C497	QFN41HK-333	MY Cap	
C498	QFN41HK-102	MY Cap	
C499	QET41CM-106	E Cap	
C500	QET61CM-106	E Cap	
C501	QET61CM-106	E Cap	
C502	QFN31HK-102	MY Cap	
C503	QFN31HK-102	MY Cap	
C504	QEK61CM-106	E Cap	
C505	QFN31HK-103	MY Cap	
C506	QCS31HJ-560	C Cap	
C507	QCS31HJ-560	C Cap	
C508	QFN31HK-472	MY Cap	
C509	QEK61HM-105	E Cap	
C510	QCF31HP-103	C Cap	
C511	QCF31HP-223	C Cap	
C512	QCS31HJ-221	C Cap	
C513	QCF31HP-223	C Cap	

Symbol No.	Part No.	Part Name	Description
L401	79V23400	Coil	
L402	79V29082	Coil	
L403	79V29116	I. F. T.	
L404	79V23400	Coil	
⚠ X401	79V20186	Crystal	4.0 MHz
CF401	79V29152	Ceramic Resonator	4.0 MHz
CN401	79V29032	Cap. Housing	
CN402	79V29032	Cap. Housing	
CN403	-	-	
CN404	79V29037	Cap. Housing	
CN405	79V29032	Cap. Housing	
CN406	79V29037	Cap. Housing	
CN407	79V26052	Cap. Housing	
CN408	79V29035	Cap. Housing	

Symbol No.	Part No.	Part Name	Description
[MECHACON Section]			
IC201	79V20158	IC, UPC339C	
IC202	79V30038	IC, M50741-604SP	
IC203	79V20342	IC, M54519P	
IC204	79V23083	IC, M50790SP	
⚠ IC205	79V30039	IC, LB1649	
IC206	-	-	
IC207	79V30040	IC, LA7225	
IC208	79V27161	IC, TA78L005AP	
Q201	-	-	
Q202	79V20927	TR, 2SD636R, S	
Q203	DTC124EF	DTC124EF	
Q204	79V20918	TR, 2SB641R,S	
⚠ Q205	79V20927	TR, 2SD637R,S	
Q206	DTA124EF	DTA124EF	
Q207	79V20927	TR, 2SD636R, S	
Q208	-	-	
Q209	DTC124EF	DTC124EF	
Q210	DTC124EF	DTC124EF	
Q211	DTA124EF	DTA124EF	
Q212	DTC124EF	DTC124EF	
Q213	79V20919	TR, 2SB643R	
Q214	DTA124EF	DTA124EF	
Q215	-	-	
Q216	-	-	
Q217	79V20918	TR, 2SB641R, S	
Q218	-	-	
Q219	DTC144EF	DTC144EF	
Q220	DTA124EF	DTA124EF	
Q221	79V30041	TR, 2SC458C, D	
D201	79V27154	Zener Diode, RD7.5EB2	
D202	79V20173	Diode, 1SS133	
D203	79V27151	Zener Diode, RD3.0EB2	
D204	79V20145	Zener Diode, RD7.5EB1	
D205	79V20173	Diode, 1SS133	
D206	79V20173	Diode, 1SS133	
D207	79V20173	Diode, 1SS133	
D208	79V27152	Zener Diode, RD4.3EB3	
D209	79V20094	Diode, MA27WA	
D210	79V27156	Zener Diode, RD8.2EB2	
D211	79V20173	Diode, 1SS133	
D212	79V20173	Diode, 1SS133	
D213	79V20173	Diode, 1SS133	
D214	-	-	
⚠ D215	79V27149	Zener Diode, RD13EB1	
⚠ D216	79V27148	Zener Diode, RD12EB2	
D217	79V20173	Diode, 1SS133	
D218	79V20173	Diode, 1SS133	
D219	79V20173	Diode, 1SS133	
D220	79V30042	Zener Diode, RD4.7EB3	
D221	79V20173	Diode, 1SS133	
D222	79V27131	PD48P12	INFRARED RECEIVER
⚠ D223	79V27150	Zener Diode, RD15EB1	
D224	-	-	

Symbol No.	Part No.	Part Name	Description
D225	–	–	
D226	79V20173	Diode, 1SS133	
D227	79V20173	Diode, 1SS133	
D228	–	–	
D229	79V20173	Diode, 1SS133	
D230	79V20173	Diode, 1SS133	
D231	–	–	
D232	–	–	
D233	–	–	
D234	–	–	
D235	79V20173	Diode, 1SS133	
D236	79V20173	Diode, 1SS133	
D237	79V20173	Diode, 1SS133	
D238	79V27149	Zener Diode RD13EB1	
D239	79V20094	Diode, MA27WA	
D240	–	–	
D241	79V20173	Diode, 1SS133	
⚠ D242	79V30043	Zener Diode HZ2C3	
D243	79V20173	Diode, 1SS133	
D244	79V20173	Diode, 1SS133	
D245	–	–	
D246	79V20173	Diode, 1SS133	
D247	79V20173	Diode, 1SS133	
D248	79V20173	Diode, 1SS133	
D249	79V20173	Diode, 1SS133	
D250	79V20173	Diode, 1SS133	
D251	79V20173	Diode, 1SS133	
D252	79V20173	Diode, 1SS133	
D253	79V20173	Diode, 1SS133	
R201	QRD161J-102	CR	
R202	QRD161J-332	CR	
R203	QRD161J-102	CR	
R204	QRD161J-103	CR	
R205	QRD161J-274	CR	
R206	QRD161J-274	CR	
R207	–	–	
R208	QRD161J-184	CR	
R209	–	–	
R210	QRD161J-103	CR	
R211	QRD161J-104	CR	
R212	QRD161J-104	CR	
R213	–	–	
R214	QRD161J-104	CR	
R215	QRD161J-472	CR	
R216	QRD161J-472	CR	
R217	QRD161J-472	CR	
R218	QRD161J-473	CR	
R219	QRD161J-473	CR	
R220	–	–	
R221	–	–	
R222	QRD161J-472	CR	
R223	QRD161J-472	CR	
R224	QRD161J-472	CR	
R225	QRD161J-472	CR	
R226	QRD161J-103	CR	
R227	QRD161J-473	CR	
R228	QRD161J-105	CR	
R229	QRD161J-183	CR	
R230	QRD161J-103	CR	
R231	QRD161J-103	CR	

Symbol No.	Part No.	Part Name	Description
R232	QRD161J-473	CR	
R233	QRD161J-103	CR	
R234	QRD161J-103	CR	
R235	QRD161J-472	CR	
R236	QRD161J-103	CR	
R237	QRD161J-104	CR	
R238	QRD161J-472	CR	
R239	QRD161J-101	CR	
R240	QRD161J-682	CR	
R241	QRD161J-472	CR	
R242	QRD161J-472	CR	
R243	QRD161J-472	CR	
R244	QRD161J-472	CR	
R245	QRD161J-472	CR	
R246	QRD161J-472	CR	
R247	QRD161J-472	CR	
R248	QRD161J-101	CR	
R249	–	–	
R250	–	–	
R251	–	–	
R252	–	–	
R253	–	–	
R254	QRD161J-103	CR	
R255	QRD161J-223	CR	
R256	–	–	
R257	–	–	
R258	–	–	
R259	–	–	
R260	QRD161J-682	CR	
R261	QRD161J-183	CR	
R262	QRD161J-273	CR	
R263	QRD161J-103	CR	
R264	QRD161J-472	CR	
R265	QRD161J-472	CR	
R266	QRD161J-472	CR	
R267	QRD161J-472	CR	
R268	QRD161J-472	CR	
R269	QRD161J-472	CR	
R270	QRD161J-103	CR	
R271	QRD161J-223	CR	
R272	–	–	
R273	–	–	
R274	QRD161J-124	CR	
R275	QRD161J-124	CR	
R276	–	–	
R277	–	–	
R278	–	–	
R279	–	–	
R280	QRD161J-104	CR	
R281	–	–	
R282	–	–	
R283	QRD161J-103	CR	
R284	–	–	
R285	QRD161J-103	CR	
R286	QRD161J-120	CR	
R287	QRD161J-102	CR	
R288	–	–	
R289	QRD161J-104	CR	
R290	QRD161J-152	CR	
R291	QRD161J-332	CR	
R292	79V29022	VR	PICTURE SHARPNESS
R293	QRD161J-103	CR	
R294	QRD161J-103	CR	

Symbol No.	Part No.	Part Name	Description
R295	QRD161J-272	CR	
R296	-	-	
R297	-	-	
R298	QRD161J-153	CR	
R299	QRD161J-103	CR	
R300	QRD161J-682	CR	
R301	QRD161J-123	CR	
R302	QRD161J-103	CR	
R303	QRD181J-223	CR	
R304	-	-	
R305	-	-	
R306	-	-	
R307	-	-	
R308	-	-	
R309	-	-	
R310	-	-	
R311	-	-	
R312	-	-	
R313	-	-	
R314	QRD161J-104	CR	
R315	QRD161J-821	CR	
R316	QRD161J-561	CR	
R317	QRD161J-561	CR	
R318	QRD161J-561	CR	
R319	QRD161J-561	CR	
R320	QRD161J-561	CR	
R321	QRD161J-102	CR	
R322	QRD161J-103	CR	
R323	QRD161J-104	CR	
R324	QRD161J-223	CR	
R325	QRD161J-104	CR	
R326	QRD161J-274	CR	
R327	QRD161J-103	CR	
R328	QRD161J-393	CR	
R329	-	-	
⚠ R330	79V26011	Posistor	
R331	QRD161J-393	CR	
R332	-	-	
R333	QRD161J-683	CR	
R334	QRD161J-223	CR	
R335	QRD161J-102	CR	
R336	QRD161J-103	CR	
RA201	79V30044	Resistor Array	
RA202	79V29154	Resistor Array	
RA203	79V29156	Resistor Array	
RA204	-	-	
RA205	79V29156	Resistor Array	
C201	-	-	
C202	QEK41HM-335	E Cap	
C203	QCS11HJ-390	C Cap	
C204	QCS31HJ-390	C Cap	
C205	QEE51CM-475	T Cap	
C206	QFN41HJ-224	MY Cap	
C207	QEK61EM-475	E Cap	
C208	-	-	
C209	-	-	
C210	-	-	
C211	-	-	
C212	QFN31HJ-473	MY Cap	

Symbol No.	Part No.	Part Name	Description
C213	QET61AM-476	E Cap	
C214	QET61AM-476	E Cap	
C215	-	-	
C216	QET61EM-475	E Cap	
C217	QEE41EM-225	T Cap	
C218	QCF31HP-223	C Cap	
C219	QCF31HP-223	C Cap	
C220	-	-	
C221	-	-	
C222	QCF31HP-103	C Cap	
C223	-	-	
C224	QFN31HJ-184	MY Cap	
C225	QFN31HJ-332	MY Cap	
C226	QET61CM-476	C Cap	
C227	QEE51EM-475	T Cap	
C228	-	-	
C229	-	-	
C230	-	-	
C231	QFN31HJ-102	MY Cap	
C232	-	-	
C233	QCF31HP-473	C Cap	
C234	QFN31HK-823	MY Cap	
C235	QFN31HJ-823	MY Cap	
C236	QCF31HP-223	C Cap	
C237	QEK61HM-335	E Cap	
L201	79V29168	Resonator	
L202	-	-	
L203	79V29072	Peaking Coil	
L204	-	-	
L205	79V29082	Coil	
L206	-	-	
L207	79V29071	Peaking Coil	
CF201	79V29167	Ceramic Filter	3.0 MHz
CN201	79V23383	Cap. Housing	
CN202	79V29043	Cap. Housing	
CN203	79V29037	Cap. Housing	
CN204	79V26052	Cap. Housing	
CN205	-	-	
CN206	-	-	
CN207	-	-	
CN208	79V29044	Cap. Housing	
CN209	79V26052	Cap. Housing	
CN210	79V29042	Cap. Housing	
CN211	79V29195	Cap. Housing	
CN212	79V29045	Cap. Housing	
CN213	-	-	
CN214	79V29046	Cap. Housing	
CN215	-	-	
CN216	79V29040	Cap. Housing	
CN217	79V29032	Cap. Housing	
CN218	79V29038	Cap. Housing	
SW201	79V29127	Slide Switch	TAPE REMAIN
SW202	79V29131	Slide Switchk	TAPE MEMORY

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Symbol No.	Part No.	Part Name	Description
IC1	79V27115	IC, HA11752	
IC2	79V27105	IC, AN6392	
IC3	79V27165	IC, TK15021	
IC4	79V27165	IC, TK15021	
IC5	79V27164	IC, TK10322	
IC6	79V27165	IC, TK15021	
IC7	79V27129	IC, M5218P	
IC8	79V27129	IC, M5218P	
IC9	79V26022	IC, TA7324P	
IC10	79V27129	IC, M5218P	
IC11	79V26022	IC, TA7324P	
IC12	79V27129	IC, M5218P	
IC13	79V27104	IC, AN6391C	
IC14	79V27104	IC, AN6391C	
IC15	79V30045	IC, EHM-X42U505	
IC16	79V30045	IC, EHM-X42U505	
IC17	79V27107	IC, BA226F	
IC18	79V27112	IC, BA634F	
IC19	79V27129	IC, M5218P	
IC20	79V27196	IC, 7VT06	
IC21	79V27196	IC, 7VT06	
Q1	79V27188	TR, 2SC2053	
Q2	79V27188	TR, 2SC2053	
Q3	79V27188	TR, 2SC2053	
Q4	79V27188	TR, 2SC2053	
Q5	79V30009	TR, DTC124EF	
Q6	79V30009	TR, DTC124EF	
Q7	79V30009	TR, DTC124EF	
Q8	79V30009	TR, DTC124EF	
Q9	79V21555	TR, 2SC2021R, S	
Q10	79V27161	IC, TA78L005AP	
Q11	79V30009	TR, DTC124EF	
Q12	79V27192	TR, 2SD545E, F	
Q13	79V27188	TR, 2SC3053	
Q14	79V30009	TR, DTC124EF	
Q15	79V27192	TR, 2SD545E, F	
Q16	79V27192	TR, 2SD545E, F	
D1	-	-	
D2	-	-	
D3	-	-	
D4	-	-	
D5	79V27124	Diode, MC2838	
D6	79V27123	Diode, MC2836	
D7	-	-	
D8	-	-	
D9	79V27123	Diode, MC2836	
D10	79V27124	Diode, MC2838	
D11	79V27123	Diode, MC2836	
D12	-	-	
D13	-	-	
D14	79V27124	Diode, MC2838	
D15	79V20373	Diode, 0A90	
D16	79V27124	Diode, MC2838	
D17	79V27123	Diode, MC2836	
D18	79V27123	Diode, MC2836	
D19	79V20173	Diode, 1ss133	

Symbol No.	Part No.	Part Name	Description
R1	QRS188J-272YN	Chip R	
R2	QRS188J-100YN	Chip R	
R3	QRS188J-272YN	Chip R	
R4	QRS188J-272YN	Chip R	
R5	QRS188J-100YN	Chip R	
R6	QRS188J-471YN	Chip R	
R7	QRS188J-471YN	Chip R	
R8	QRS188J-561YN	Chip R	
R9	QRS188J-103YN	Chip R	
R10	QRS188J-123YN	Chip R	
R11	QRS188J-123YN	Chip R	
R12	QRS188J-103YN	Chip R	
R13	QRS188J-561YN	Chip R	
R14	QRS188J-102YN	Chip R	
R15	-	-	
R16	QRS188J-224YN	Chip R	
R17	QRS188J-223YN	Chip R	
R18	QRS188J-471YN	Chip R	
R19	QRS188J-561YN	Chip R	
R20	QRS188J-121YN	Chip R	
R21	QRS188J-102YN	Chip R	
R22	QRS188J-393YN	Chip R	
R23	QRS188J-102YN	Chip R	
R24	79V29024	VR	CH 1 EE
R25	79V29024	VR	CH 2 EE
R26	QRS188J-823YN	Chip R	
R27	QRS188J-124YN	Chip R	
R28	QRS188J-823YN	Chip R	
R29	QRS188J-124YN	Chip R	
R30	79V29024	VR	CH 1 FMA EE
R31	79V29024	VR	CH 2 FMA EE
R32	QRS188J-123YN	Chip R	
R33	QRS188J-123YN	Chip R	
R34	QRS188J-123YN	Chip R	
R35	-	-	
R36	QRS188J-124YN	Chip R	
R37	QRS188J-123YN	Chip R	
R38	-	-	
R39	QRS188J-124YN	Chip R	
R40	QRS188J-123YN	Chip R	
R41	QRS188J-124YN	Chip R	
R42	QRS188J-123YN	Chip R	
R43	QRS188J-124YN	Chip R	
R44	QRS188J-222YN	Chip R	
R45	QRS188J-222YN	Chip R	
⚠ R46	79V30046	CR	
R47	QRS188J-473YN	Chip R	
R48	QRS188J-473YN	Chip R	
R49	QRS188J-473YN	Chip R	
R50	QRS188J-473YN	Chip R	
R51	QRS188J-124YN	Chip R	
R52	QRS188J-124YN	Chip R	
R53	QRS188J-222YN	Chip R	
R54	QRS188J-472YN	Chip R	
R55	QRS188J-472YN	Chip R	
R56	QRS188J-222YN	Chip R	
R57	QRS188J-124YN	Chip R	
R58	QRS188J-124YN	Chip R	
R59	QRS188J-222YN	Chip R	
R60	QRS188J-222YN	Chip R	
R61	-	-	
R62	QRS188J-124YN	Chip R	
R63	QRS188J-103YN	Chip R	
R64	QRS188J-272YN	Chip R	

Symbol No.	Part No.	Part Name	Description
R65	QRS188J-124YN	Chip R	
R66	QRS188J-124YN	Chip R	
R67	QRS188J-272YN	Chip R	
R68	QRS188J-103YN	Chip R	
R69	QRS188J-124YN	Chip R	
R70	QRS188J-122YN	Chip R	
R71	QRS188J-223YN	Chip R	
R72	QRS188J-332YN	Chip R	
R73	QRS188J-124YN	Chip R	
R74	QRS188J-392YN	Chip R	
R75	QRS188J-392YN	Chip R	
R76	79V29024	VR	CH 2 LEVEL
R77	79V29024	VR	CH 1 LEVEL
R78	-	-	
R79	-	-	
R80	-	-	
R81	-	-	
R82	QRS188J-124YN	Chip R	
R83	QRS188J-124YN	Chip R	
R84	QRS188J-392YN	Chip R	
R85	QRS188J-562YN	Chip R	
R86	QRS188J-124YN	Chip R	
R87	QRS188J-124YN	Chip R	
R88	QRS188J-392YN	Chip R	
R89	QRS188J-562YN	Chip R	
R90	-	-	
R91	QRS188J-0R0Y	Chip R	
R92	-	-	
R93	QRS188J-0R0Y	Chip R	
R94	QRS188J-122YN	Chip R	
R95	QRS188J-223YN	Chip R	
R96	QRS188J-332YN	Chip R	
R97	QRS188J-124YN	Chip R	
R98	QRS188J-222YN	Chip R	
R99	QRS188J-562YN	Chip R	
R100	QRS188J-104YN	Chip R	
R101	QRS188J-104YN	Chip R	
R102	QRS188J-223YN	Chip R	
R103	QRS188J-562YN	Chip R	
R104	QRS188J-562YN	Chip R	
R105	QRS188J-822YN	Chip R	
R106	QRS188J-562YN	Chip R	
R107	QRS188J-562YN	Chip R	
R108	79V29024	VR	CH 1 REC DEV.
R109	QRS188J-220YN	Chip R	
R110	QRD182J-225	CR	
R111	QRS188J-333YN	Chip R	
R112	QRS188J-183YN	Chip R	
R113	QRS188J-562YN	Chip R	
R114	79V29025	VR	CH 1 CARR. ADJ.
R115	QRD182J-392	CR	
R116	QRS188J-102YN	Chip R	
R117	79V29026	VR	1.4 M REC LEVEL
R118	-	-	
R119	-	-	
R120	QRS188J-123YN	Chip R	
R121	QRS188J-102YN	Chip R	
R122	QRS188J-102YN	Chip R	
R123	QRS188J-123YN	Chip R	
R124	QRS188J-0R0Y	Chip R	
R125	QRS188J-222YN	Chip R	
R126	79V29027	VR	CH 1 PB LEVEL

Symbol No.	Part No.	Part Name	Description
R127	QRS188J-102YN	Chip R	
R128	QRS188J-102YN	Chip R	
R129	-	-	
R130	QRS188J-222YN	Chip R	
R131	QRS188J-562YN	Chip R	
R132	QRS188J-104YN	Chip R	
R133	QRS188J-223YN	Chip R	
R134	QRS188J-562YN	Chip R	
R135	QRS188J-104YN	Chip R	
R136	QRS188J-822YN	Chip R	
R137	79V29024	VR	CH 2 REC DEV
R138	QRS188J-220YN	Chip R	
R139	QRD182J-225	CR	
R140	QRS188J-333YN	Chip R	
R141	QRS188J-183YN	Chip R	
R142	QRS188J-562YN	Chip R	
R143	79V29025	VR	CH 2 CARR. ADJ.
R144	QRD182J-222	CR	
R145	QRS188J-102YN	Chip R	
R146	79V29026	VR	1.8 M REC LEVEL
R147	-	-	
R148	-	-	
R149	QRS188J-272YN	Chip R	
R150	QRS188J-102YN	Chip R	
R151	QRS188J-102YN	Chip R	
R152	QRS188J-0R0Y	Chip R	
R153	QRS188J-222YN	Chip R	
R154	79V29027	VR	CH 2 PB LEVEL
R155	QRS188J-102YN	Chip R	
R156	QRS188J-104YN	Chip R	
R157	QRS188J-103YN	Chip R	
R158	QRS188J-472YN	Chip R	
R159	QRS188J-102YN	Chip R	
R160	QRS188J-104YN	Chip R	
R161	QRS188J-103YN	Chip R	
R162	QRS188J-472YN	Chip R	
R163	-	-	
R164	-	-	
R165	-	-	
R166	-	-	
R167	-	-	
R168	-	-	
R169	-	-	
R170	-	-	
R171	QRS188J-223YN	Chip R	
R172	79V30049	VR	CH 2 SW
R173	QRS188J-561YN	Chip R	
R174	QRS188J-183YN	Chip R	
R175	79V30049	VR	CH 1 SW
R176	QRS188J-183YN	Chip R	
R177	QRS188J-682YN	Chip R	
R178	QRD161J-122	CR	
R179	QRS188J-681YN	Chip R	
R180	QRS188J-682YN	Chip R	
R181	QRS188J-272YN	Chip R	
R182	QRS188J-153YN	Chip R	
R183	QRS188J-272YN	Chip R	
R184	QRS188J-153YN	Chip R	
R185	QRS188J-103YN	Chip R	
R186	QRS188J-103YN	Chip R	
R187	QRS188J-223YN	Chip R	
R188	QRS188J-472YN	Chip R	

Symbol No.	Part No.	Part Name	Description
R189	QRS188J-222YN	Chip R	
R190	QRS188J-391YN	Chip R	
R191	QRS188J-272YN	Chip R	
R192	QRS188J-472YN	Chip R	
R193	QRS188J-272YN	Chip R	
R194	QRS188J-332YN	Chip R	
R195	QRS188J-103YN	Chip R	
R196	QRS188J-472YN	Chip R	
⚠ R197	79V30046	CR	
R198	-	-	
R199	QRS188J-332YN	Chip R	
R200	QRS188J-103YN	Chip R	
R201	QRS188J-151YN	Chip R	
R202	QRS188J-331YN	Chip R	
R203	QRS188J-182YN	Chip R	
R204	QRS188J-124YN	Chip R	
R205	QRS188J-153YN	Chip R	
R206	QRS188J-124YN	Chip R	
R207	QRS188J-273YN	Chip R	
R208	QRS188J-273YN	Chip R	
R209	QRS188J-124YN	Chip R	
R210	QRS188J-221YN	Chip R	
R211	QRS188J-153YN	Chip R	
R212	QRS188J-124YN	Chip R	
R213	-	-	
R214	QRS188J-822YN	Chip R	
R215	QRS188J-822YN	Chip R	
R216	-	-	
R217	QRS188J-123YN	Chip R	
R218	QRS188J-123YN	Chip R	
R219	QRS188J-104YN	Chip R	
R220	-	-	
R221	-	-	
R222	QRS188J-123YN	Chip R	
R223	QRS188J-104YN	Chip R	
R224	QRS188J-104YN	Chip R	
R225	QRS188J-103YN	Chip R	
R226	QRS188J-152YN	Chip R	
R227	QRS188J-102YN	Chip R	
R228	QRS188J-102YN	Chip R	
R229	QRS188J-222YN	Chip R	
R230	QRS188J-102YN	Chip R	
R231	QRS188J-102YN	Chip R	
R232	QRS188J-103YN	Chip R	
R233	QRS188J-103YN	Chip R	
R234	QRS188J-821YN	Chip R	
R235	QRS188J-821YN	Chip R	
R236	QRS188J-103YN	Chip R	
R237	QRS188J-103YN	Chip R	
R238	QRS188J-OROY	Chip R	
R239	-	-	
R240	QRS188J-122YN	Chip R	
R241	-	-	
R242	-	-	
R243	QRS188J-222YN	Chip R	
R244	QRS188J-222YN	Chip R	
R245	-	-	
R246	QRS188J-103YN	Chip R	
R247	QRS188J-105YN	Chip R	
R248	QRS188J-102YN	Chip R	
R249	QRS188J-OROY	Chip R	
R250	QRS188J-OROY	Chip R	
R251	-	-	
R252	QRD161J-221	CR	

Symbol No.	Part No.	Part Name	Description
B21	QRS188J-OROY	Chip R	
C1	QCT81CH-470ZL	Chip Cap	
C2	QEPA1HM-105	NP Cap	
C3	QCY81EK-223ZL	Chip Cap	
C4	QCY81EK-223ZL	Chip Cap	
C5	QCY81EK-223ZL	Chip Cap	
C6	QCY81EK-223ZL	Chip Cap	
C7	QCY81EK-223ZL	Chip Cap	
C8	QCT81CH-181ZL	Chip Cap	
C9	QCT81CH-181ZL	Chip Cap	
C10	QCS81HJ-102ZL	Chip Cap	
C11	QER41HM-105	E Cap	
C12	QCS81HJ-102ZL	Chip Cap	
C13	QER41HM-105	E Cap	
C14	QCY81EK-223ZL	Chip Cap	
C15	QER40JM-336	E Cap	
C16	QCY81EK-223ZL	Chip Cap	
C17	QCT81CH-331ZL	Chip Cap	
C18	QER41HM-224	E Cap	
C19	QER40JM-336	E Cap	
C20	QCY81EK-223ZL	Chip Cap	
C21	QER40JM-336	E Cap	
C22	QCY81EK-223ZL	Chip Cap	
C23	QCY81EK-223ZL	Chip Cap	
C24	QCY81EK-223ZL	Chip Cap	
C25	QCT81CH-270ZL	Chip Cap	
C26	QER41HM-105	E Cap	
C27	QCY81EK-223ZL	Chip Cap	
C28	QCY81EK-223ZL	Chip Cap	
C29	QER41CM-226	E Cap	
C30	QCS81HJ-102ZL	Chip Cap	
C31	QER41EM-475	E Cap	
C32	QER41EM-475	E Cap	
C33	QER41EM-475	E Cap	
C34	QER41EM-475	E Cap	
C35	QER41EM-475	E Cap	
C36	QER41EM-475	E Cap	
C37	QER41EM-475	E Cap	
C38	QER41EM-475	E Cap	
C39	QER41EM-475	E Cap	
C40	QER41EM-475	E Cap	
C41	QER41EM-475	E Cap	
C42	QER41EM-475	E Cap	
C43	QER41EM-475	E Cap	
C44	-	-	
C45	QER41EM-475	E Cap	
C46	-	-	
C47	QER41EM-475	E Cap	
C48	QER41EM-475	E Cap	
C49	QER40JM-226	E Cap	
C50	QER40JM-226	E Cap	
C51	QER41CM-476	E Cap	
C52	QER41HM-105	E Cap	
C53	QCY81HK-562ZL	Chip Cap	
C54	QEPA1EM-475	NP Cap	
C55	QER41HM-105	E Cap	
C56	QCY81HK-562ZL	Chip Cap	
C57	QEPA1EM-475	NP Cap	
C58	QER41HM-105	E Cap	
C59	QER41EM-475	E Cap	
C60	QER41EM-475	E Cap	
C61	QER41HM-105	E Cap	

Symbol No.	Part No.	Part Name	Description
C62	QER41CM-476	E Cap	
C63	QER40JM-226	E Cap	
C64	QER40JM-476	E Cap	
C65	QER40JM-476	E Cap	
C66	QER40JM-226	E Cap	
C67	-	-	
C68	-	-	
C69	-	-	
C70	-	-	
C71	QER41EM-475	E Cap	
C72	QER41EM-475	E Cap	
C73	QER40JM-107	E Cap	
C74	QER41EM-475	E Cap	
C75	QER40JM-107	E Cap	
C76	QER41EM-475	E Cap	
C77	QER41CM-336	E Cap	
C78	PU54820G-822	PP Cap	8200pF
C79	QER41CM-106	E Cap	
C80	QER41CM-106	E Cap	
C81	QER41CM-106	E Cap	
C82	QER41CM-106	E Cap	
C83	QER41CM-106	E Cap	
C84	QER41CM-106	E Cap	
C85	QER40JM-107	E Cap	
C86	QER41EM-475	E Cap	
C87	QEPA1EM-475	NP Cap	
C88	QCT81CH-101ZL	Chip Cap	
C89	QCS81HJ-102ZL	Chip Cap	
C90	QCY81EK-223ZL	Chip Cap	
C91	QCT81CH-820ZL	Chip Cap	
C92	ACY81EK-223ZL	Chip Cap	
C93	QCT81CH-101ZL	Chip Cap	
C94	-	-	
C95	QCY81EK-223ZL	Chip Cap	
C96	QEPA1EM-475	NP Cap	
C97	QER40JM-476	E Cap	
C98	QER41CM-106	E Cap	
C99	PU54820G-822	PP Cap	8200pF
C100	QCY81HK-562ZL	Chip Cap	
C101	QER41CM-106	E Cap	
C102	QER40JM-476	E Cap	
C103	OCT81CH-101ZL	Chip Cap	
C104	QCF81EP-334ZL	Chip Cap	
C105	QER40JM-336	E Cap	
C106	QCS81HJ-332ZL	Chip Cap	
C107	-	-	
C108	QER40JM-476	E Cap	
C109	PU54820G-822	PP Cap	8200pF
C110	QER41CM-106	E Cap	
C111	QER41CM-106	E Cap	
C112	QER41CM-106	E Cap	
C113	QEPA1EM-475	NP Cap	
C114	QER41CM-106	E Cap	
C115	QER40JM-107	E Cap	
C116	QER41EM-475	E Cap	
C117	QEPA1EM-475	NP Cap	
C118	QCT81CH-101ZL	Chip Cap	
C119	QCS81HJ-102ZL	Chip Cap	
C120	QCY81EK-223ZL	Chip Cap	
C121	QCT81CH-820ZL	Chip Cap	
C122	QCY81EK-223ZL	Chip Cap	
C123	QRS188J-OROY	Chip R	(R251)
C124	QCT81CH-101ZL	Chip Cap	
C125	-	-	

Symbol No.	Part No.	Part Name	Description
C126	QCY81EK-223-ZL	Chip Cap	
C127	QER40JM-476	E Cap	
C128	QER41CM-106	E Cap	
C129	PU54820G-822	PP Cap	8200pF
C130	QCY81HK-562ZL	Chip Cap	
C131	QER41CM-106	E Cap	
C132	QER40JM-476	E Cap	
C133	QCS81HJ-332ZL	Chip Cap	
C134	QCT81CH-101ZL	Chip Cap	
C135	QCF81EP-334ZL	Chip Cap	
C136	QER40JM-336	E Cap	
C137	QER40JM-476	E Cap	
C138	-	-	
C139	QFZ9011-104	MP Cap	
C140	QER41CM-226	E Cap	
C141	QFZ9011-104	MP Cap	
C142	QCS81HJ-102ZL	Chip Cap	
C143	QCS81HJ-102ZL	Chip Cap	
C144	QER41CM-476	E Cap	
C145	QER41CM-106	E Cap	
C146	QER41CM-106	E Cap	
C147	QCT81CH-820ZL	Chip Cap	
C148	QCY81EK-223ZL	Chip Cap	
C149	QER41CM-106	E Cap	
C150	QER41CM-106	E Cap	
C151	QER41CM-106	E Cap	
C152	QER41CM-106	E Cap	
C153	QER41CM-476	E Cap	
C154	QER41CM-476	E Cap	
C155	QER40JM-336	E Cap	
C156	QER40JM-336	E Cap	
C157	QER41CM-226	E Cap	
C158	QER40JM-336	E Cap	
C159	QER40JM-336	E Cap	
C160	QCT81CH-101ZL	Chip Cap	
C161	QCT81CH-101ZL	Chip Cap	
C162	QER41CM-106	E Cap	
C163	QER41CM-106	E Cap	
C164	QCY81HK-103ZL	Chip Cap	
C165	QCY81HK-103ZL	Chip Cap	
C166	QCY81HK-103ZL	Chip Cap	
C167	QER41EM-475	E Cap	
C168	QER41EM-475	E Cap	
C169	-	-	
C170	QCY81EK-223ZL	Chip Cap	
C171	QER41CM-476	E Cap	
C172	QCY81HK-103ZL	Chip Cap	
C173	QCY81HK-103ZL	Chip Cap	
C174	QCS81HJ-152ZL	Chip Cap	
C175	QFN41HJ-102	MY Cap	
C176	QFN41HJ-102	MY Cap	
C177	QCY81EK-223ZL	Chip Cap	
C178	QCY81EK-223ZL	Chip Cap	
C179	QCY81EK-223ZL	C Cap	
C180	QCY81EK-223ZL	C Cap	
C181	QER41CM-476	E Cap	
C182	QCY81EK-223ZL	Chip Cap	

Symbol No.	Part No.	Part Name	Description
⚠ L1	79V29059	Peaking Coil	
L2	79V29074	Peaking Coil	
⚠ L3	79V29059	Peaking Coil	
⚠ L4	79V29059	Peaking Coil	
⚠ L5	79V29059	Peaking Coil	
L6	79V30050	Peaking Coil	
L7	-	-	
L8	79V29083	Coil	
L9	79V30050	Peaking Coil	
L10	-	-	
L11	79V29083	Coil	
T1	79V29173	STEP-UP Trans.	
T2	79V29173	STEP-UP Trans.	
T3	79V29174	Low Pass Filter	
T4	79V29174	Low Pass Filter	
T5	79V30051	Band Pass Filter	
T6	79V30052	Band Pass Filter	
⚠ CP1	79V20458	IC Protector	
⚠ CP2	79V20458	IC Protector	
⚠ CP3	79V20458	IC Protector	
	79V29177	Test Pin	
CN1	79V23382	Cap. Housing	
CN2	79V29033	Cap. Housing	
CN3	79V29033	Cap. Housing	
CN4	-	-	
CN5	79V29033	Cap. Housing	
CN6	79V29033	Cap. Housing	
CN7	79V26052	Cap. Housing	
CN8	79V22074	Cap. Housing	
CN9	79V23382	Cap. Housing	
CN10	-	-	
CN11	79V29038	Cap. Housing	
CN12	79V22071	Cap. Housing	
CN13	79V29033	Cap. Housing	
CN14	79V26052	Cap. Housing	
CN15	79V26052	Cap. Housing	
CN16	-	-	
CN17	79V22071	Cap. Housing	
CN18	79V22068	Cap. Housing	
CN19	79V29033	Cap. Housing	
CN20	-	-	
CN21	79V22068	Cap. Housing	
	79V30053	Earth Plate	
	79V30054	Washer	
	79V29180	Shield Case (A)	
	79V30055	Shield Cover	
	79V29179	Board Holder	× 2
	79V23189	Screw	× 2

0 6 OPERATION BOARD ASSEMBLY.... 79V30056

Symbol No.	Part No.	Part Name	Description
(Operation (1) Board Assembly			
D1	79V27159	L.E.D. SLP-981C-50	
D2	-	-	
D3	79V27159	L.E.D. SLP-981C-50	
D4	79V29182	L.E.D. SLR-34MT4	
D5	79V27159	L.E.D. SLP-981C-50	
D6	79V27159	L.E.D. SLP-981C-50	
D7	79V20173	Diode, 1SS133	
R1	QRD161J-331	CR	
R2	-	-	
R3	QRD161J-102	CR	
R4	QRD161J-331	CR	
R5	QRD161J-331	CR	
R6	QRD161J-331	CR	
SW1	-	-	
SW2	79V29132	Push Switch	TIMER
SW3	79V29132	Push Switch	OPERATE
SW4	79V29132	Push Switch	SP/LP
	79V30057	LED Holder	× 5
(Operation (2) Board Assembly.................. 79V30058			
⚠ IC1	79V20338	IC, M50115AP	
Q1	79V20926	TR, 2SD636Q, R	
Q2	79V21137	TR, 2SB641Q, R	
Q3	79V30059	TR, DTA124EF	
D8	79V20173	Diode, 1SS133	
D9	79V20173	Diode, 1SS133	
D10	79V29182	L.E.D. SLR-34MT4	
D11	79V29182	L.E.D. SLR-34MT4	
D12	79V29182	L.E.D. SLR-34MT4	
D13	79V29182	L.E.D. SLR-34MT4	
D14	79V29182	L.E.D. SLR-34MT4	
D15	79V29182	L.E.D. SLR-34MT4	
D16	79V29182	L.E.D. SLR-34MT4	
D17	79V29182	L.E.D. SLR-34MT4	
D18	79V29182	L.E.D. SLR-34MT4	
D19	79V29182	L.E.D. SLR-34MT4	
D20	79V29182	L.E.D. SLR-34MT4	
D21	79V29182	L.E.D. SLR-34MT4	
D22	79V29182	L.E.D. SLR-34MT4	
D23	79V29182	L.E.D. SLR-34MT4	
D24	79V29182	L.E.D. SLR-34MT4	
D25	79V29182	L.E.D. SLR-34MT4	
D26	-	-	
D27	79V20169	Zener Diode RD2.0EC	
D28	79V20173	Diode 1SS133	

NOTE: "× 2" indicates two pieces.

Symbol No.	Part No.	Part Name	Description
R7	–	–	
R8	QRD161J-104	CR	
R9	QRD161J-471	CR	
R10	QRD161J-331	CR	
R11	QRD161J-331	CR	
R12	QRD161J-331	CR	
R13	QRD161J-331	CR	
R14	QRD161J-331	CR	
R15	QRD161J-331	CR	
R16	QRD161J-103	CR	
C1	QCS11HJ-151	C Cap	
C2	QCS11HJ-151	C Cap	
SW5	79V29538	Tact Switch	SEARCH (REV)
SW6	79V29538	Tact Switch	SEARCH (FWD)
SW7	79V23156	Tact Switch	PLAY
SW8	79V23156	Tact Switch	PAUSE/STILL
SW9	79V23156	Tact Switch	SHUTTLE SCH.(FF)
SW10	79V23156	Tact Switch	SHUTTLE SCH.(REW)
SW11	79V23156	Tact Switch	STOP
SW12	79V23156	Tact Switch	EJECT
SW13	79V23156	Tact Switch	AUDIO DUB.
SW14	79V23156	Tact Switch	REC
SW15	79V23156	Tact Switch	INSERT
⚠ CF1	79V20404	Ceramic Filter	455kHz
	79V30060	Search Shade	
	79V30061	Search Cap	
	79V30062	LED Holder	for D11-D15 D17,D18
	79V29189	LED Shade	×9

NOTE: "×5" & "×9" indicates five and nine pieces

07 TUNER/IF BOARD ASSEMBLY......... 79V30063

Symbol No.	Part No.	Part Name	Description
⚠ IC1	79V23085	IC, M51316P	
IC2	79V30121	IC, LA7910	
IC3	79V20355	IC, UPC358C	
Q1	79V23503	TR, 2SC2636ST	
Q2	79V23503	TR, 2SC2636ST	
Q3	–	–	
Q4	79V20918	TR, 2SB641R, S	
Q5	79V20932	TR, 2SD637R, S	
Q6	79V20932	TR, 2SD637R, S	
Q7	79V20932	TR, 2SD637R, S	
Q8	–	–	
Q9	79V23105	TR, 2SD639S	
Q10	79V30122	TR, 2SD1206P, Q, R	
Q11	79V20932	TR, 2SD637R, S	
Q12	79V30123	TR, DTC144EF	
Q13	79V30123	TR, DTC144EF	
⚠ Q14	79V26506	TR, 2SB810J	
Q15	79V20932	TR, 2SD637R, S	
Q16	79V20922	TR, 2SB644R, S	
Q17	79V23105	TR, 2SD639S	
Q18	–	–	
Q19	79V30123	TR, DTC144EF	
D1	79V21119	Zener Diode, RD6.8EB2	
D2	79V20173	Diode, 1SS133	
D3	79V20173	Diode, 1SS133	
D4	79V20173	Diode, 1SS133	
D5	79V20173	Diode, 1SS133	
D6	79V20173	Diode, 1SS133	
D7	79V20173	Diode, 1SS133	
D8	79V23122	L.E.D. LTZ-R15	
⚠ D9	79V20068	IC, UPC574J-KL	
D10	–	–	
D11	–	–	
D12	–	–	
D13	–	–	
D14	79V30064	Diode, 1SS152	
R1	–		
R2	QRD161J-331	CR	
R3	QRD161J-103	CR	
R4	QRD161J-152	CR	
R5	QRD161J-470	CR	
R6	QRD161J-681	CR	
R7	QRD161J-101	CR	
R8	–	–	
R9	QRD161J-103	CR	
R10	QRD161J-152	CR	
R11	QRD161J-101	CR	
R12	QRD161J-101	CR	
R13	QRD161J-220	CR	
R14	–	–	
R15	–	–	

Symbol No.	Part No.	Part Name	Description
R16	QRD161J-102	CR	
R17	79V20846	VR	RF AGC
R18	QRD161J-102	CR	
R19	QRD161J-222	CR	
R20	QRD161J-153	CR	
R21	QRD161J-334	CR	
R22	QRD161J-332	CR	
R23	QRD161J-332	CR	
R24	QRD161J-101	CR	
R25	QRD161J-474	CR	
R26	QRD161J-104	CR	
R27	QRD161J-331	CR	
R28	QRD161J-102	CR	
R29	QRD161J-223	CR	
R30	QRD161J-273	CR	
R31	QRD161J-122	CR	
R32	QRD161J-222	CR	
R33	QRD161J-822	CR	
R34	QRD161J-104	CR	
R35	79V23461	VR	COLOUR LEVEL
R36	-	-	
R37	QRD161J-471	CR	
R38	QRD161J-151	CR	
R39	QRD161J-100	CR	
R40	QRD161J-334	CR	
R41	QRD161J-103	CR	
R42	QRD161J-471	CR	
R43	QRD161J-103	CR	
R44	QRD161J-103	CR	
R45	QRD161J-103	CR	
R46	QRD161J-331	CR	
R47	QRD161J-223	CR	
R48	QRD161J-222	CR	
R49	-	-	
R50	-	-	
R51	-	-	
R52	QRD161J-104	CR	
R53	QRD161J-104	CR	
R54	QRD161J-103	CR	
R55	QRD161J-472	CR	
R56	-	-	
R57	QRD161J-104	CR	
R58	QRD161J-104	CR	
R59	QRD161J-103	CR	
R60	-	-	
R61	-	-	
R62	QRD161J-224	CR	
R63	QRD161J-333	CR	
R64	QRD161J-394	CR	
R65	QRD161J-103	CR	
R66	QRD161J-103	CR	
R67	QRD161J-154	CR	
R68	QRD161J-154	CR	
R69	QRD161J-154	CR	
R70	QRD161J-104	CR	
R71	-	-	
R72	-	-	
R73	-	-	
R74	QRD161J-473	CR	
R75	QRD187J-121	CR	
R76	QRD187J-332	CR	
R77	-	-	
R78	QRD161J-272	CR	
R79	QRD161J-334	CR	

Symbol No.	Part No.	Part Name	Description
⚠ R80	QRD161J-472	CR	
R81	QRD161J-103	CR	
R82	QRD161J-472	CR	
R83	QRD161J-472	CR	
R84	QRD161J-472	CR	
R85	QRD161J-102	CR	
R86	QRD161J-473	CR	
R87	QRD161J-473	CR	
R88	-	-	
⚠ R89	79V26011	Posistor	
R90	-	-	
R91	-	-	
R92	-	-	
R93	-	-	
R94	-	-	
R95	-	-	
R96	-	-	
R97	-	-	
R98	-	-	
R99	-	-	
R100	-	-	
R101	-	-	
R102	-	-	
R103	-	-	
R104	-	-	
R105	-	-	
R106	-	-	
R107	-	-	
R108	-	-	
R109	-	-	
R110	QRD161J-103	CR	
R111	QRD161J-154	CR	
R112	QRD161J-103	CR	
C1	QCY31HK-102	C Cap	
C2	-	-	
C3	-	-	
C4	QCY31HK-102	C Cap	
C5	QCY31HK-102	C Cap	
C6	-	-	
C7	-	-	
C8	-	-	
C9	QCY31HK-222	C Cap	
C10	QCY31HK-222	C Cap	
C11	QCY31HK-102	C Cap	
C12	QCY31HK-102	C Cap	
C13	QCY31HK-102	C Cap	
C14	QCY31HK-222	C Cap	
C15	QCS31HJ-220	C Cap	
C16	-	-	
C17	-		
C18	-	-	
C19	-	-	
C20	QCY31HK-222	C Cap	
C21	QCY31HK-222	C Cap	
C22	QCY31HK-222	C Cap	
C23	QCY31HK-222	C Cap	
C24	QET61HM-474	E Cap	
C25	QCY31HK-222	C Cap	

Symbol No.	Part No.	Part Name	Description
C26	QET61CM-106	E Cap	
C27	QFN31HK-473	MY Cap	
C28	QET61CM-106	E Cap	
C29	QET61EM-475	E Cap	
C30	-	-	
C31	QET61HM-105	E Cap	
C32	QCY31HK-222	C Cap	
C33	QCT25CH-180	C Cap	
C34	QCT25PH-560	C Cap	
C35	QCY31HK-102	C Cap	
C36	QCT25HH-680	C Cap	
C37	QCT25CH-6R0	C Cap	
C38	-	-	
C39	-	-	
C40	QFN31HK-104	MY Cap	
C41	QET61CM-336	E Cap	
C42	QET61CM-106	E Cap	
C43	QCS31HJ-180	C Cap	
C44	-	-	
C45	QET61CM-107	E Cap	
C46	QCF31HP-103	C Cap	
C47	QET61HM-105	E Cap	
C48	QFN31HK-102	My Cap	
C49	-	-	
C50	QET61CM-106	E Cap	
C51	QET61CM-106	E Cap	
C52	QFN31HK-223	MY Cap	
C53	QFN31HK-223	My Cap	
C54	-	-	
C55	QET61HM-105	E Cap	
C56	-	-	
C57	QET61HM-225	E Cap	
C58	QET61CM-227	E Cap	
C59	-	-	
C60	QCY31HK-102	C Cap	
C61	QFN31HJ-333	MY Cap	
C62	QFN31HJ-333	MY Cap	
C63	QFN31HJ-153	MY Cap	
C64	QFN31HJ-153	My Cap	
C65	QCF31HP103	C Cap	
C66	-	-	
C67	QCY31HK-222	C Cap	
C68	QET61EM-475	E Cap	
C69	-	-	
C70	-	-	
C71	QET61HM-474	E Cap	
C72	QET61CM-106	E Cap	
C73	QET61CM-106	E Cap	
C74	QET61HM-106	E Cap	
C75	QET61CM-336	E Cap	
C76	QET61HM-106	E Cap	
C77	QET61HM-106	E Cap	
C78	QCS31HJ-101	C Cap	
C79	QET61CM-476	E Cap	
C80	-	-	
C81	-	-	
C82	-	-	
C83	-	-	
C84	-	-	
C85	-	-	
C86	-	-	
C87	-	-	
C88	-	-	
C89	-	-	

Symbol No.	Part No.	Part Name	Description
C90	-	-	
C91	-	-	
C92	-	-	
C93	-	-	
C94	-	-	
C95	-	-	
C96	-	-	
C97	-	-	
C98	-	-	
C99	-	-	
C100	QCY31HK-222	C Cap	
C101	-	-	
C102	-	-	
C103	-	-	
C104	-	-	
C105	QET61CM-106	E Cap	
L1	79V24842	Coil	
L2	79V24842	Coil	
L3	79V30065	Coil	
L4	-	-	
L5	-	-	
L6	79V25365	Coil	
L7	79V25418	Peaking Coil	
L8	79V23372	Peaking Coil	
L9	79V23375	Peaking Coil	
L10	79V21598	Peaking Coil	
L11	79V23378	Peaking Coil	
⚠	79V30066	Tuner	
SAW1	79V24014	Saw Filter	
⚠ CF1	79V22018	Ceramic Filter	5.5MHz
⚠ T1	79V30067	Coil (Tuning)	34.47MHz
⚠ T2	79V24012	IFT (Sound Trap)	33.4MHz
⚠ T3	79V30068	Coil (Video Tuning)	38.9MHz
⚠ T4	79V24013	IFT (AFC)	38.9MHz
⚠ T5	79V22029	IFT (Fh Tuning)	15.625kHz
T6	79V22013	IFT (IF Tuning)	37.9MHz
	79V20762	Test Pin	TP12A, Band 14
CN1	-	-	
CN2	-	-	
CN3	-	-	
CN4	79V29032	Cap Housing	
CN5	-	-	
CN6	-	-	
CN7	-	-	
CN8	79V20645	Cap Housing	
CN9	79V26067	Jack Ass'y	IF OUT

Symbol No.	Part No.	Part Name	Description
	79V30069	Shield Case (1)	
	79V30070	Shield Plate (1)	
	79V30071	Shield Cover (1)	
	79V29198	Shield Case (2)	
	79V30072	Shield Plate (2)	
	79V30073	Shield Cover (2)	

08 DISPLAY BOARD ASSEMBLY.......... 79V30074

Symbol No.	Part No.	Part Name	Description
Q1	79V20059	TR, DTC124EF	
D1	79V20152	Diode, MA161	
D2	79V20152	Diode, MA161	
D3	79V20145	Zener Diode, RD7.5EB1	
D4	79V27159	L.E.D SLP-981C-50	
D5	79V27159	L.E.D SLP-981C-50	
D6	79V29209	L.E.D SLR-34MC3F	
D7	79V29209	L.E.D SLR-34MC3F	
D8	79V27159	L.E.D SLP-981C-50	
R1	QRD181J-102	CR	
R2	QRD181J-102	CR	
R3	QRD181J-681	CR	
R4	79V29030	Slide VR	
R5	QRD181J-681	CR	
R6	QRD181J-681	CR	
R7	QRD181J-271	CR	
C1	QER51HM-225G	E Cap	
C2	QER51HM-225G	E Cap	
CN1	79V21617	Cap. Housing	
CN2	79V21617	Cap. Housing	
CN3	79V21617	Cap. Housing	
CN4	79V29038	Cap. Housing	
CN5	79V29040	Cap. Housing	
CN6	79V29032	Cap. Housing	
SW1	79V23156	Tact Switch	CH DOWN
SW2	79V23156	Tact Switch	CH UP
SW3	79V23156	Tact Switch	COUNT/ REMAIN
SW4	79V23156	Tact Switch	RESET
SW5	79V23156	Tact Switch	INSTANT REC
SW6	79V29132	Push Switch	AUDIO LIMITER
FD1	79V30075	F.D.P.	
	79V29533	Display Holder Ass'y	
	79V29219	Display Holder	Incl. PQ40431A-2
	79V29220	Cushion	Incl. PQ40431A-2
	79V29212	LED Shade	for D4-8
	79V30076	LED Spacer	for D4-6, 8
	79V29211	LED Spacer	for D7
	79V29213	Fix Plate	
	79V20514	Screw	×4
	79V29214	Slide Guide	
	79V30077	Slide Knob	
	79V30078	Slide Knob	
	79V29216	Tapping Screw	×2

NOTE: "×2" & "×4" indicates two and four pieces.

0 9 TUNER/TIMER CTL BOARD ASSEMBLY 79V30079

Symbol No.	Part No.	Part Name	Description
⚠ IC1	79V30080	IC, UPD7519H-013-36	
IC2	79V23092	IC, TL066CP	
IC3	79V23203	IC, LM339N	
IC4	79V23088	IC, MN1219	
IC5	79V23203	IC, TL066CP	
Q1	79V25700	TR, DTC114YE	
Q2	79V20059	TR, DTC124EF	
⚠ Q3	79V20086	TR, 2SD638R, S	
D1	79V20139	Diode, MA167	
D2	79V20139	Diode, MA167	
D3	79V20139	Diode, MA167	
D4	79V20139	Diode, MA167	
D5	79V20139	Diode, MA167	
D6	79V20139	Diode, MA167	
D7	79V20139	Diode, MA167	
D8	79V20139	Diode, MA167	
D9	–	–	
D10	–	–	
D11	–	–	
D12	–	–	
⚠ D13	79V27121	Zener Diode, HZ9A3	
D14	–	–	
D15	79V20139	Diode, MA167	
⚠ D16	79V23122	L.E.D. LTZ-R15	
⚠ D17	79V20139	Diode, MA167	
⚠ D18	79V20139	Diode, MA167	
⚠ D19	79V20378	Zener Diode, HZ6A-1L	
⚠ D20	79V20094	Diode, MA27WA	
D21	–	–	
D22	79V20173	Diode, 1SS133	
D23	79V20173	Diode, 1SS133	
R1	QRD161J-222	CR	
R2	QRD161J-820	CR	
R3	QRD161J-333	CR	
R4	QRD161J-273	CR	
R5	QRD161J-472	CR	
R6	QRD161J-103	CR	
R7	QRD161J-103	CR	
R8	QRD161J-103	CR	
R9	QRD161J-103	CR	
R10	QRD161J-224	CR	
R11	QRD161J-394	CR	
R12	QRD161J-473	CR	
R13	QRD161J-564	CR	
R14	QRD161J-333	CR	
R15	QRD161J-474	CR	
R16	QRD161J-684	CR	
R17	QRD161J-222	CR	
R18	QRD161J-222	CR	
R19	QRD161J-222	CR	
R20	QRD161J-222	CR	
R21	QRD161J-103	CR	
R22	QRD161J-103	CR	
R23	QRD161J-103	CR	
R24	QRD161J-103	CR	
R25	QRD161J-103	CR	
R26	QRD161J-103	CR	
R27	QRD161J-183	CR	
R28	QRD161J-183	CR	
R29	QRD161J-102	CR	
R30	QRD161J-102	CR	
R31	QRD161J-102	CR	
R32	QRD161J-102	CR	
R33	QRD161J-103	CR	
R34	QRD161J-222	CR	
R35	QRD161J-622	CR	
R36	QRD161J-392	CR	
R37	QRD161J-184	CR	
R38	QRD161J-274	CR	
R39	QRD161J-184	CR	
R40	QRD161J-154	CR	
R41	QRD161J-103	CR	
R42	QRD161J-105	CR	
R43	QRD161J-105	CR	
R44	QRD161J-680	CR	
R45	QRD161J-105	CR	
R46	QRD161J-224	CR	
R47	QRD161J-105	CR	
R48	QRD161J-683	CR	
R49	QRD161J-393	CR	
R50	QRD161J-223	CR	
R51	QRD161J-123	CR	
R52	QRD161J-223	CR	
R53	QRD161J-104	CR	
R54	QRD161J-473	CR	
R55	QRD161J-824	CR	
R56	QRD161J-333	CR	
R57	QRD161J-124	CR	
R58	QRD161J-334	CR	
R59	QRD161J-473	CR	
R60	QRD161J-333	CR	
R61	QRD161J-563	CR	
R62	–	–	
R63	–	–	
R64	–	–	
R65	–	–	
R66	–	–	
R67	–	–	
R68	–	–	
R69	–	–	
R70	–	–	
R71	QRD161J-105	CR	
R72	–	–	
R73	–	–	
R74	–	–	
R75	–	–	
R76	–	–	
R77	–	–	
R78	–	–	
R79	QRD161J-333	CR	
R80	–	–	
R81	QRD161J-333	CR	

Symbol No.	Part No.	Part Name	Description
RA1	79V24021	Resistor Array	
RA2	-	-	
RA3	79V22005	Resistor Array	
RA4	79V20428	Resistor Array	
RA5	79V20426	Resistor Array	
RA6	79V20426	Resistor Array	
C1	QCF31HP-223	C Cap	
C2	QET61HM-225	E Cap	
C3	QCF31HP-472	C Cap	
C4	QET61HM-105	E Cap	
C5	-	-	
C6	79V23441	TR Cap	TIMER CLOCK
C7	QCS31HJ-5R0	C Cap	
C8	QCS31HJ-180	C Cap	
C9	QCF31HP-223	C Cap	
C10	QET61HM-474	E Cap	
C11	QET61HM-105	E Cap	
C12	PU52749-474	E Cap	0.47 µF 5.5V
C13	QEK60JM-107	E Cap	
C14	QEK60JM-107	E Cap	
C15	QEK61HM-225	E Cap	
C16	QEK61CM-336	E Cap	
C17	QET61VM-336	E Cap	
C18	QCF31HP-223	C Cap	
C19	QCF31HP-223	C Cap	
C20	QCF31HP-223	C Cap	
C21	-	-	
C22	QCF11HP-222	C Cap	
C23	QCF11HP-222	C Cap	
⚠ L1	79V21596	Peaking Coil	
⚠ X1	79V23166	Crystal	4.19 MHz
CN1	79V20639	Cap. Housing	
CN2	79V20638	Cap. Housing	
CN3	79V29038	Cap. Housing	
CN4	79V26052	Cap. Housing	
CN5	79V29045	Cap. Housing	
CN6	79V29045	Cap. Housing	
CN7	79V29040	Cap. Housing	
	79V20662	Test Pin	TP1-3
SW1	79V23156	Tact Switch	STORE
SW2	79V23156	Tact Switch	SKIP
SW3	79V23156	Tact Switch	CH SET
SW4	79V23156	Tact Switch	U BAND
SW5	79V23156	Tact Switch	3RD BAND
SW6	79V23156	Tact Switch	1ST BAND
SW7	79V23156	Tact Switch	MANUAL +
SW8	79V23156	Tact Switch	MANUAL -
SW9	-	-	
SW10	79V29132	Push Switch	AFC
	79V30081	CH Set Buttons	
	79V30082	Button	AFC

10 TERMINAL BOARD ASSEMBLY...... 79V30083

Symbol No.	Part No.	Part Name	Description
⚠ Q1	79V20089	TR, 2SB643R, S	
Q2	79V27185	TR, 2SB911M, Q, MR	
Q3	79V30124	TR, DTC114EF	
D1	79V20173	Diode, 1SS133	
⚠ D2	79V20173	Diode, 1SS133	
D3	79V20173	Diode, 1SS133	
⚠ D4	79V20173	Diode, 1SS133	
R1	QRD161J-153	CR	
R2	QRD161J-333	CR	
R3	QRD161J-153	CR	
R4	QRD161J-333	CR	
R5	QRD161J-102	CR	
R6	QRD161J-102	CR	
R7	QRD161J-102	CR	
R8	QRD161J-102	CR	
R9	QRD161J-102	CR	
R10	QRD161J-102	CR	
R11	QRD162J-122	CR	
R12	QRD162J-122	CR	
R13	QRD161J-221	CR	
R14	QRD161J-750	CR	
⚠ R15	QRD161J-272	CR	
⚠ R16	QRD161J-393	CR	
R17	QRD161J-563	CR	
R18	QRD161J-102	CR	
R19	QRD161J-103	CR	
RY1	79V23410	Relay	
SW1	79V30084	Slide Switch	VIDEO NODE
SW2	79V30085	Slide Switch	DYAC
CN1	79V29224	Camera Connector	
	79V30086	Jack board Ass'y	
	79V20892	Screw	× 2

NOTE: "× 2" indicates two pieces.

1 1 MIX BOOSTER BORAD ASSEMBLY 79V30125

Symbol No.	Part No.	Part Name	Description
⚠	79V24809	Mix Booster	
C200	ACF11HP-102	C Cap	

1 2 A/CTL HEAD BOARD

Symbol No.	Part No.	Part Name	Description
	79V29344	A/CTL Head Board	
R1	QRD167J-100	CR	
R2	QRD167J-100	CR	
CN1	79V29038	Cap. Housing	

1 3 END SENSOR BOARD

Symbol No.	Part No.	Part Name	Description
	79V23406	End Sensor Board	
Q1	79V30126	PT352\	
C4	QCF11HP-103	C Cap	

1 4 LOADING SENSOR BOARD

Symbol No.	Part No.	Part Name	Description
	79V29360	Loading Sinsor Board	
Q1	79V29357	Photo Sensor	
R1	QRD162J-391	CR	

1 5 LED BOARD

Symbol No.	Part No.	Part Name	Description
	79V30087	LED Board	

1 6 PRE AMP BOARD ASSEMBLY 79V30088

Symbol No.	Part No.	Part Name	Description
IC1	79V27117	IC, HA11782	
IC2	79V27117	IC, HA11782	
Q1	79V27187	TR, 2SC2712Y	
Q2	79V27187	TR, 2SC2712Y	
Q3	79V27187	TR, 2SC2712Y	
Q4	79V27187	TR, 2SC2712Y	
Q5	79V27187	TR, 2SC2712Y	
Q6	79V27187	TR, 2SC2712Y	
Q7	79V27187	TR, 2SC2712Y	
Q8	79V27187	TR, 2SC2712Y	
R1	79V30089	VR	SP CH BAL.
R2	QRS188J-101YN	Chip R	
R3	QRS188J-333YN	Chip R	
R4	QRS188J-103YN	Chip R	
R5	QRS188J-103YN	Chip R	
R6	QRS188J-123YN	Chip R	
R7	QRS188J-123YN	Chip R	
R8	79V29667	VR	SP CH1Q
R9	79V29667	VR	SP CH2Q
R10	QRS188J-122YN	Chip R	
R11	QRS188J-122YN	Chip R	
R12	QRS188J-122YN	Chip R	
R13	QRS188J-122YN	Chip R	
R14	QRS188J-3R9YN	Chip R	
R15	QRS188J-3R9YN	Chip R	
R16	QRS188J-390YN	Chip R	
R17	QRS188J-390YN	Chip R	
R18	79V30089	VR	LP CH BAL.
R19	QRS188J-101YN	Chip R	
R20	QRS188J-333YN	Chip R	
R21	QRS188J-103YN	Chip R	
R22	QRS188J-103YN	Chip R	
R23	QRS188J-123YN	Chip R	
R24	QRS188J-123YN	Chip R	
R25	79V29667	VR	LP CH2Q
R26	79V30090	VR	LP CH1Q
R27	QRS188J-122YN	Chip R	
R28	QRS188J-122YN	Chip R	
R29	QRS188J-122YN	Chip R	
R30	QRS188J-122YN	Chip R	
R31	QRS188J-3R9YN	Chip R	
R32	QRS188J-3R9YN	Chip R	
R33	QRS188J-390YN	Chip R	
R34	QRS188J-390YN	Chip R	
R35	QRS188J-681YN	Chip R	
R36	QRS188J-681YN	Chip R	
R37	QRS188J-681YN	Chip R	
R37	QRS188J-681YN	Chip R	

Symbol No.	Part No.	Part Name	Description
C1	QEK60JM-476	E Cap	
C2	QEK60JM-476	E Cap	
C3	QCY81EK-223ZL	Chip Cap	
C4	QCY81EK-223ZL	Chip Cap	
C5	QCY81EK-223ZL	Chip Cap	
C6	QCY81EK-223ZL	Chip Cap	
C7	QCY81EK-223ZL	Chip Cap	
C8	QCY81EK-223ZL	Chip Cap	
C9	QCY81EK-223ZL	Chip Cap	
C10	QCY81EK-223ZL	Chip Cap	
C11	79V30091	TR Cap	SP CH 1 FC
C12	79V30091	TR Cap	SP CH 2 FC
C13	QCY81EK-223ZL	Chip Cap	
C14	QCY81EK-223ZL	Chip Cap	
C15	QCY81EK-223ZL	Chip Cap	
C16	QCY81EK-223ZL	Chip Cap	
C17	QCY81EK-223ZL	Chip Cap	
C18	QCY81EK-223ZL	Chip Cap	
C19	QEK61HM-105	E Cap	
C20	QEK61HM-105	E Cap	
C21	QEK60JM-476	E Cap	
C22	QER40JM-476	E Cap	
C23	QCY81EK-223ZL	Chip Cap	
C24	QCY81EK-223ZL	Chip Cap	
C25	QCY81EK-223ZL	Chip Cap	
C26	QCY81EK-223ZL	Chip Cap	
C27	QCY81EK-223ZL	Chip Cap	
C28	QCY81EK-223ZL	Chip Cap	
C29	QCY81EK-223ZL	Chip Cap	
C30	QCY81EK-223ZL	Chip Cap	
C31	79V30091	TR Cap	LP CH 2 FC
C32	79V30091	TR Cap	LP CH 1 FC
C33	QCY81EK-223ZL	Chip Cap	
C34	QCY81EK-223ZL	Chip Cap	
C35	QCY81EK-223ZL	Chip Cap	
C36	QCY81EK-223ZL	Chip Cap	
C37	QCY81EK-223ZL	Chip Cap	
C38	QCY81EK-223ZL	Chip Cap	
C39	QEK61HM-105	E Cap	
C40	QER41HM-105	E Cap	
C41	-	-	
C42	QCY81EK-223ZL	Chip Cap	
C43	QCY81EK-223ZL	Chip Cap	
C44	QCY81EK-223ZL	Chip Cap	
C45	QCY81EK-223ZL	Chip Cap	
C46	-	-	
C47	-	-	
C48	QCY81EK-223ZL	Chip Cap	
C49	QCY81EK-223ZL	Chip Cap	
C50	QCY81EK-223ZL	Chip Cap	
C51	QCY81EK-223ZL	Chip Cap	
C52	-	-	
C53	QCS81HJ-100ZL	Chip Cap	

Symbol No.	Part No.	Part Name	Description
L1	79V21596	Peaking Coil	
L2	79V21596	Peaking Coil	
L3	79V29062	Peaking Coil	
L4	79V29062	Peaking Coil	
CN1	79V29048	Cap. Housing	
	79V20662	Test Pin	TP 1-4
B1	QRS188J-0R0Y	Chip R	
	79V30092	Shield Case	

17 FULL ERASE HEAD BOARD

Symbol No.	Part No.	Part Name	Description
	79V23411	Full Erase Head Board	
CN1	79V20628	Cap. Housing	

18 CASSETTE HOUSING BOARD

Symbol No.	Part No.	Part Name	Description
	79V29418	Cass. Housing Board	
Q1	79V30126	PT-352V	
C1	QCF11HP-103	C Cap	
C2	QCF11EZ-223	C Cap	
C3	QCF11EZ-223	C Cap	
CN1	79V29044	Cap. Housing	

20 DRUM MDA BOARD ASSEMBLY.... 79V30093

Symbol No.	Part No.	Part Name	Description
IC1	79V29229	IC, AN6671K	
⚠ Q1	79V24207	TR. 2SA1020C Y	
D1	79V27177	Diode 11DQ04	
D2	79V20173	Diode 1SS133	
R1	QRD161J-102	CR	
R2	QRD161J-105	CR	
R3	QRD161J-105	CR	
R4	QRD161J-222	CR	
R5	QRD161J-222	CR	
R6	QRD161J-102	CR	
R7	QRD161J-102	CR	
R8	QRD161J-223	CR	
R9	QRD161J-473	CR	
R10	QRD161J-561	CR	
R11	QRD161J-333	CR	
R12	QRD161J-682	CR	
R13	QRD161J-222	CR	
⚠ R14	79V30094	MFR	
R15	QRD161J-102	CR	
R16	QRD161J-121	CR	
R17	QRD182J-181	CR	
R18	QRD161J-821	CR	
R19	QRD161J-222	CR	
R20	QRD161J-222	CR	
R21	QRD161J-222	CR	
R22	QRD161J-222	CR	
R23	QRD161J-222	CR	
R24	QRD161J-103	CR	
⚠ R25	79V30095	Posistor	
C1	QET41HM-225	E Cap	
C2	QFN31HK-473	MY Cap	
C3	QFN31HK-333	MY Cap	
C4	QFN31HK-223	MY Cap	
C5	QEU61EM-106	E Cap	
C6	QEU61HM-225	E Cap	
C7	QET41HM-225	E Cap	
C8	QET41HM-225	E Cap	
C9	QEU61EM-107	E Cap	
C10	QEU61EM-107	E Cap	
C11	QFN31HK-223	MY Cap	
C12	QET41EM-107	E Cap	
C13	QFZ9012-104	MY Cap	
C14	QFZ9012-104	MY Cap	
⚠ L1	79V29084	Coil	

Symbol No.	Part No.	Part Name	Description
CN1	-	-	
CN2	79V29037	Cap Housing	
CN3	79V29032	Cap Housing	
CN4	-	-	
CN5	79V26052	Cap Housing	
CN6	79V26052	Cap Housing	
	79V29230	Shield Case Cap	
	79V29231	Shield Case Cap	
	79V29232	Sield Case Cap	
	79V23363	Collar	for R14

21 REEL SENSOR ASSEMBLY (SUP).... 79V29408

Symbol No.	Part No.	Part Name	Description
	79V29409	Senser Board (SUP)	
	79V27142	Hall Elenent	
	79V30096	Sensor Holder	

22 REEL SENSOR ASSEMBLY (TU)....... 79V29410

Symbol No.	Part No.	Part Name	Description
	79V29411	Sensor Board (TU)	
	79V27142	Hall Element	
	79V30097	Sensor Holder (TU)	

23 DRUM MOTOR CONN. BOARD ASSEMBLY........................ 79V30098

Symbol No.	Part No.	Part Name	Description
	79V30099	Drum Motor Board	
CN1	79V22077	Cap Housing	
CN2	79V22068	Cap Housing	

2 4 DEMODULATOR BOARD ASSEMBLY 79V30101

Symbol No.	Part No.	Part Name	Description
IC801	79V2600	IC, LA7505	
IC802	79V20067	IC, UPC1391H	
IC803	79V20067	IC, UPC1391H	
IC804	79V20356	IC, UPC4558C	
IC805	79V26001	IC, LA7751	
IC806	79V26018	IC, PU52779	
IC807	79V20355	IC, UPC358C	
IC808	79V26200	IC, TA37324P	
Q801	79V20069	TR, 2SC2188	
Q802	79V20927	TR, 2SD636R, S	
Q803	79V20927	TR, 2SD636R, S	
Q804	79V20927	TR, 2SD636R, S	
D801	79V20173	Diode, 1SS133	
D802	79V20173	Diode, 1SS133	
D803	79V20075	Diode, MA150	
D804	79V20075	Diode, MA150	
D805	79V20173	Diode, 1SS133	
D806	79V20173	Diode, 1SS133	
D807	79V20173	Diode, 1SS133	
D808	79V20173	Diode, 1SS133	
D809	79V20173	Diode, 1SS133	
D810	–	–	
D811	79V20173	Diode, 1SS133	
D812	79V20173	Diode, 1SS133	
D813	79V20173	Diode, 1SS133	
D814	79V20173	Diode, 1SS133	
R801	QRD161J-750	CR	
R802	QRD161J-102	CR	
R803	–	–	
R804	QRD161J-270	CR	
R805	–	–	
R806	QRD161J-821	CR	
R807	QRD161J-821	CR	
R808	QRD161J-331	CR	
R809	QRD161J-471	CR	
R810	QRD161J-472	CR	
R811	QRD161J-232	CR	
R812	QRD161J-271	CR	
R813	QRD161J-391	CR	
⚠ R814	QRZ0052-100	FR	
R815	79V25400	VR	CH 1 LEVEL
R816	QRD187J-103	CR	
R817	QRD161J-331	CR	
R818	QRD161J-471	CR	
R819	QRD161J-271	CR	
R820	QRD161J-391	CR	

Symbol No.	Part No.	Part Name	Description
⚠ R821	QRD0052-100	FR	
R822	QRD161J-182	CR	
R823	79V25399	VR	CH 2 DEEMP
R824	QRD161J-153	CR	
R825	QRD161J-103	CR	
R826	QRD161J-103	CR	
R827	QRD161J-333	CR	
R828	QRD161J-123	CR	
R829	QRD161J-123	CR	
R830	QRD161J-332	CR	
R831	QRD161J-123	CR	
R832	QRD161J-123	CR	
R833	QRD161J-473	CR	
R834	QRD161J-103	CR	
R835	QRD161J-333	CR	
R836	79V25400	VR	SEPARATION
R837	QRD161J-271	CR	
R838	79V26077	VR	PILOT CARR.
⚠ R839	79V26013	Posistor	
⚠ R840	QRZ0052-100	FR	
R841	QRD161J-102	CR	
R842	QRD161J-273	CR	
R843	QRD161J-274	CR	
R844	QRD161J-273	CR	
R845	QRD161J-332	CR	
R846	QRD161J-822	CR	
R847	QRD161J-274	CR	
R848	QRD161J-155	CR	
R849	QRD161J-102	CR	
R850	QRD161J-155	CR	
R851	QRD161J-102	CR	
R852	79V26076	VR	CH 2 LEVEL
R853	79V26076	VR	CH 1 LEVEL
R854	QRD161J-122	CR	
R855	QRD161J-223	CR	
R856	QRD161J-224	CR	
R857	QRD144J-681	CR	
R858	QRD161J-682	CR	
R859	QRD161J-333	CR	
R860	–	–	
R861	QRD161J-333	CR	
R862	QRD144J-681	CR	
R863	QRD161J-222	CR	
R864	QRD161J-222	CR	
R865	QRD161J-154	CR	
R866	QRD161J-103	CR	
R867	QRD161J-103	CR	
R868	79V26054	Posistor	
R869	–	–	
R870	–	–	
R871	QRD167J-822	CR	

Symbol No.	Part No.	Part Name	Description
C801	QCF31HP-222	C Cap	
C802	QCY31HK-222	C Cap	
C803	QCF31HP-222	C Cap	
C804	QCF31HP-472	C Cap	
C805	QCF31HP-103	C Cap	
C806	QFN31HK-472	MY Cap	
C807	QCY41HK-222	C Cap	
C808	-	-	
C809	QET61CM-107	E Cap	
C810	-	-	
C811	QCF31HP-223	C Cap	
C812	QCF31HP-223	C Cap	
C813	QCS31HJ-220	C Cap	
C814	QET61CM-336	E Cap	
C815	QCF31HP-223	C Cap	
C816	QFN31HK-223	MY Cap	
C817	QEN61CM-116	NP CAP	
C818	QCF31HP-223	C Cap	
C819	QCF31HP-223	C Cap	
C820	QCS31HJ-220	C Cap	
C821	QET61CM-336	E Cap	
C822	QCF31HP-223	C Cap	
C823	QFN31HK-223	MY Cap	
C824	QET61CM-106	E Cap	
C825	QEN61CM-106	NP Cap	
C826	QET61CM-106	E Cap	
C827	QET61CM-476	E Cap	
C828	QET61CM-476	E Cap	
C829	QET61HM-105	E Cap	
C830	-	-	
C831	QET61CM-106	E Cap	
C832	QET61HM-105	E Cap	
C833	QET61CM-106	E Cap	
C834	QET61CM-106	E Cap	
C835	QET61CM-106	E Cap	
C836	QET61CM-106	E Cap	
C837	QCS31HJ-271	C Cap	
C838	QCF31HP-223	C Cap	
C839	QET61CM-477	E Cap	
C840	-	-	
C841	QET61HM-474	E Cap	
C842	QET61HM-105	E Cap	
C843	QET61CM-476	E Cap	
C844	QET61CM-106	E Cap	
C845	QET61CM-106	E Cap	
C846	QET61CM-106	E Cap	
C847	QET61CM-106	E Cap	
C848	QET61CM-226	E Cap	
C849	QCY31HK-102	C Cap	
C850	QCF31HP-103	C Cap	
C851	QEE41CM-475	T Cap	
C852	QET61CM-476	E Cap	
C853	QET61CM-476	E Cap	
C854	QET61CM-336	E Cap	
C855	QET61CM-336	E Cap	
C856	QET61CM-227	E Cap	
C857	QCF31HP-223	C Cap	
C858	QET61HM-474	E Cap	
C859	QET41CM-108	E Cap	
C860	-	-	
C861	QCF31HP-472	C Cap	
C862	QCF11HP-222	C Cap	
C863	QCF11HP-222	C Cap	
C864	QCF11HP-102	C Cap	

Symbol No.	Part No.	Part Name	Description
C865	-	-	
C866	QET41HM-335	E Cap	
C867	QET41HM-335	E Cap	
L801	79V30101	Peaking Coil	
⚠ L802	79V30102	Peaking Coil	
SAWS01	79V30103	Saw Filter	
CF801	79V24228	Ceramic Filter	5.5 MHz BPF
CF802	79V26010	Ceramic Filter	5.5 MHz BPF
CF803	79V22019	Ceramic Filter	5.5 MHz DET
CF804	79V26014	Ceramic Filter	5.74 MHz BPF
CF805	79V26015	Ceramic Filter	5.74 MHz BPF
CF806	79V26008	Ceramic Filter	5.74 MHz BPF
T801	79V26016	IFT	38.9 MHz
T802	79V26017	IFT	38.9 MHz DET
T803	79V26056	IFT	54.7 kHz BPF
⚠ T804	79V26055	Coil	54.7 kHz BPF
J801	79V26067	Jack Ass'y	IF IN
	79V23368	Test Pin	TP803–809, 811–813, 815–819, 821
CN1	-	-	
CN2	79V20638	Cap. Housing	21–22
CN3	79V20645	Cap. Housing	31–34
CN4	79V20647	Cap. Housing	41–44
CN5	-	-	
CN6	79V20642	Cap. Housing	11–13
CN7	79V20640	Cap. Housing	51–52
	79V30104	Shield Case	
	79V30105	Shield Cover	
	79V30106	Shield Plate	

25 PROGRAM BOARD ASSEMBLY...... 79V30107

Symbol No.	Part No.	Part Name	Description
D1	79V20075	Diode MA[illegible]	
SW1	79V23156	Tact Switch	REPEAT
SW2	79V23156	Tact Switch	CANCEL
SW3	79V23156	Tact Switch	TIMER
SW4	79V23156	Tact Switch	CLOCK
SW5	79V23156	Tact Switch	CLOCK ADJ
SW6	79V23156	Tact Switch	TV PROGRAM
SW7	79V23156	Tact Switch	STOP
SW8	79V23156	Tact Switch	START
SW9	79V23156	Tact Switch	MIN -
SW10	79V23156	Tact Switch	MIN -
SW11	79V23156	Tact Switch	HOUR
SW12	79V23156	Tact Switch	DAY
SW13	79V23156	Tact Switch	SP/LP
SW14	79V23156	Tact Switch	DIMMER
SW15	79V30108	Slide Switch	STEREO MAIN/SUB

26 POWER TRANSISTOR BOARD

Symbol No.	Part No.	Part Name	Description
	79V29303	Power TR Board	
Q01	79V20099	TR, 2SD880Y-[illegible]	
L1	79V29053	Choke Coil	
	79V29303	Heat Sink	
	79V20659	TR Spacer	
	79V20625	Isolation Washer	
	79V29405	Screw	× 2
	79V29108	Tap. Screw	

NOTE: "× 2" indicates two pieces.

27 DRUM FG BOARD

Symbol No.	Part No.	Part Name	Description
	79V30109	Drum FG Board	
	79V30110	Mini Screw	× 2

NOTE: "× 2" indicates two pieces.

29 AUDIO LEVEL IND. ASSEMBLY....... 79V30111

Symbol No.	Part No.	Part Name	Description
IC1	79V29235	Integrated Circuit	
IC2	79V29235	Integrated Circuit	
R1	QRS188J-473YN	Chip R	
R2	QRS188J-103YN	Chip R	
R3	QRS188J-333YN	Chip R	
R4	QRS188J-103YN	Chip R	
C1	QER41CM-106	E Cap	
C2	QER41CM-106	E Cap	
C3	QCF11HP-223	C Cap	

30 MODE CTL MOTOR BOARD

Symbol No.	Part No.	Part Name	Description
	79V29373	Mode CTL Motor Board	
C1	QEN61HM-105	NP Cap	
C2	QCF11HP-223	C Cap	
C3	QCF11HP-223	C Cap	
CN1	79V22071	Cap. Housing	

RM REMOTE CONTROL BOARD ASSEMBLY 79V29239

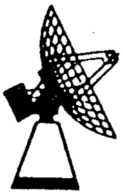
Symbol No.	Part No.	Part Name	Description
⚠ IC1	79V20338	IC, M50115AP	
⚠ Q1	79V20923	TR, 2SB822Q, R, S	
⚠ Q2	79V30112	TR, 2SC1740S	
⚠ Q3	79V30112	TR, 2SC1740S	
⚠ D1	79V20884	LED, SE303A	
⚠ D2	79V20884	LED, SE303A	
⚠ D3	79V29240	LED, SLB-220R	
⚠ D4	79V20372	Diode, 1S2473	
⚠ D5	79V20372	Diode, 1S2473	
⚠ D6	79V20372	Diode, 1S2473	
⚠ D7	79V20372	Diode, 1S2473	
⚠ D8	79V20372	Diode, 1S2473	
⚠ D9	79V20372	Diode, 1S2473	
⚠ D10	79V20372	Diode, 1S2473	
⚠ D11	79V20372	Diode, 1S2473	
⚠ D12	79V20372	Diode, 1S2473	
⚠ D13	79V20372	Diode, 1S2473	
⚠ D14	79V20372	Diode, 1S2473	
⚠ D15	79V20372	Diode, 1S2473	
⚠ R1	79V30113	CR	
⚠ R2	79V30113	CR	
⚠ R3	79V25419	CR	
⚠ R4	79V30114	CR	
⚠ R5	79V30115	CR	
⚠ R6	79V30116	CR	
⚠ R7	79V30117	CR	
⚠ R8	79V30118	CR	
⚠ C1	79V30119	E Cap	
⚠ C2	79V30120	C Cap	
⚠ C3	79V30120	C Cap	
⚠ X1	79V29241	Ceramic Filter	
	79V29242	PC Joiner	
	79V29243	Cushion	

NEC VHS PAL

MODEL N895EG

COLOUR VIDEO CASSETTE RECORDER
SERVICE MANUAL

ORDER NO. 549910278



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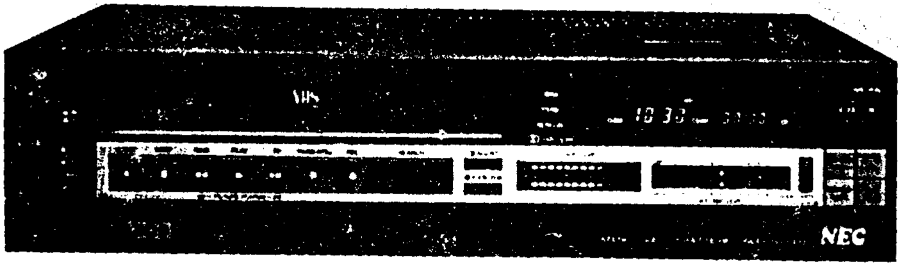

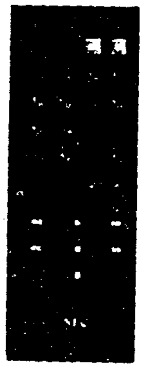

SPECIFICATIONS

Format		VHS PAL standard with Hi-Fi audio
Video recording system		Rotary, two-head helical scan system with slant double-azimuth combination video heads
Hi-Fi audio recording system		Deep-layer recording system conforming to stereo Hi-Fi VHS standard
No. of audio channels		2 Hi-Fi audio channels 2 normal audio channels
Video signal system		PAL colour and CCIR monochrome signals, 625 lines
Tape width		12.65 mm
Tape speed	(SP)	23.39 mm/sec ±0.5%
	(LP)	11.70 mm/sec ±0.5%
Maximum recording time	(SP)	240 min. with E-240 video cassette
	(LP)	480 min. with E-240 video cassette
Temperature		
Operating		5°C to 40°C
Storage		–20°C to 60°C
Power requirement		220V ∿, 50/60 Hz
Power consumption		40W (50W with camera)
Camera connector output		12V —, Max. 8W
Video		
Input		0.5 to 2.0 Vp-p, 75 ohms unbalanced
Output		1.0 Vp-p, 75 ohms unbalanced
Signal-to-noise ratio		43 dB (Rohde & Schwarz noise meter) with PICTURE SHARPNESS control at centre position
Horizontal resolution		250 lines with PICTURE SHARPNESS control at centre position
Audio		
Input		Mic: -67 dBs, high impedance, unbalanced AUDIO LINE IN connector (RCA × 2): –20 dBs, 50 k-ohms, unbalanced AUDIO/VIDEO socket (21-pin): –8 dBs, 50 k-ohms, unbalanced
Output level		AUDIO/VIDEO socket (21-pin Peri connector): 0 dBs, high impedance load MIXED AUDIO OUT connector (RCA × 2): –6 dBs, high impedance load
Output impedance		Less than 1 k-ohm, unbalanced
Signal-to-noise ratio		More than 40 dB (Dolby NR on)
Frequency range		70 Hz to 10,000 Hz
Hi-Fi audio		
Output level		Hi-Fi AUDIO OUT connector (RCA × 2): –6 dBs, high impedance load
Frequency response		20 Hz – 20,000 Hz
Dynamic range		More than 80 dB
Wow and flutter		Less than 0.005% WRMS
TV tuner/RF section		
Channel storage capacity		32 channels
Aerial input		VHF band I, 47 – 118 MHz VHF band III, 118 – 300 MHz UHF band IV/V, 470 – 862 MHz
Aerial output		UHF channels 32 – 40 (Adjustable)
Digital clock/timer		
Clock display		24-hour flouorescent digital display with day indication
Reference frequency		Quartz controlled
Start time setting		Within 2 weeks
Programming capacity		8 programmes
Dimensions		435 mm (W) × 105 mm(H) × 379 mm(D)
Weight		9.4 kg
Provided accessories		Aerial cable, Cassette tape E-30 Infrared remote control RB-85EG, "R6"-size battery × 2, Audio cable (RCA-RCA)

Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.

NEC Corporation
TOKYO, JAPAN

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Important Safety Precautions

Prior to shipment from the factory, NEC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors

5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

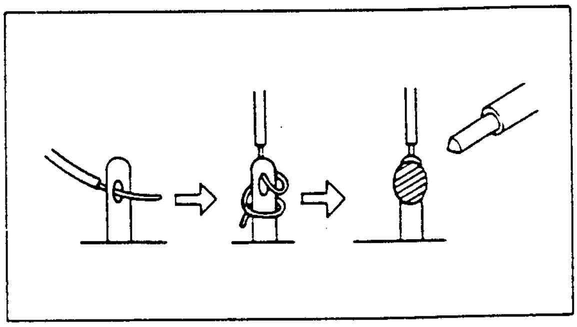


Fig. 1

6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

7. Check that replaced wires do not contact sharp edged or pointed parts.

8. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

9. Also check areas surrounding repaired locations.

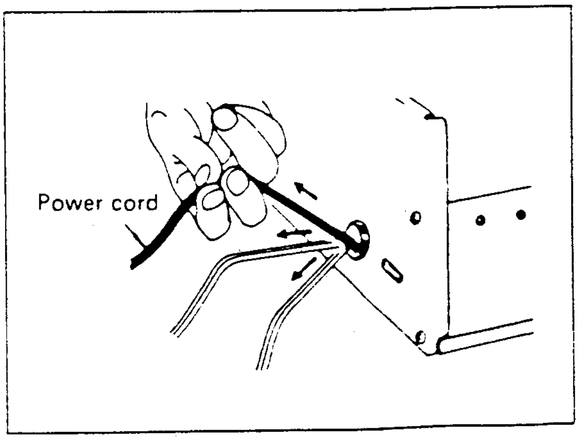


Fig. 2

10. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the parts specified. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

11. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

1. Connector part number : E03830-001
2. Required tool : Connector crimping tool of the proper type which will not damage insulated parts.
3. Replacement procedure
   1) Remove the old connector by cutting the wires at a point close to the connector.
      Important : Do not reuse a connector (discard it).
   2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.
   3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.
   4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.
   5) Check the four points noted in Fig. 7.

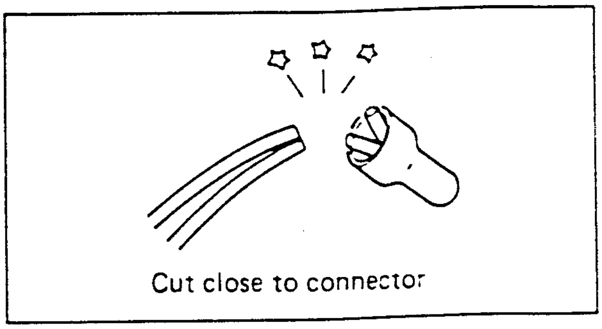

Cut close to connector

Fig. 3

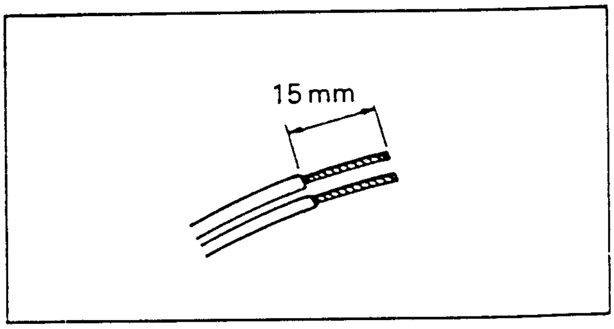


Fig. 4

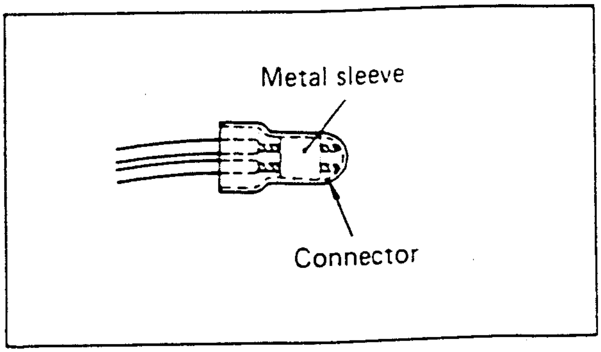

Metal sleeve
Connector

Fig. 5

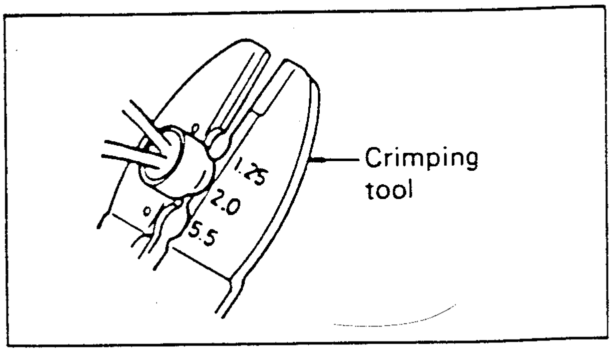

1.25
2.0
5.5
Crimping tool

Fig. 6

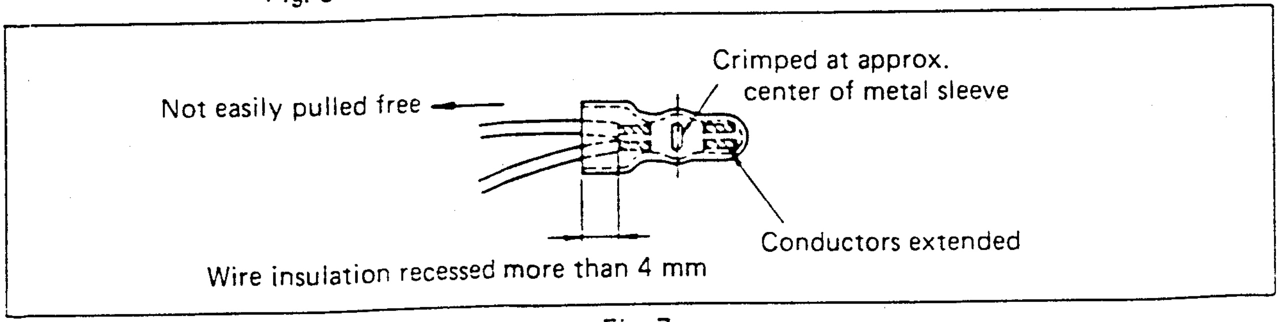

Crimped at approx. center of metal sleeve
Not easily pulled free
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**

   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table below.

2. **Dielectric strength test**

   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.) See table below.

3. **Clearance distance**

   When replacing primary circuit components, confirm specified clearance distance (d),(d') between soldered terminals, and between terminals and surrounding metallic parts. See table below.

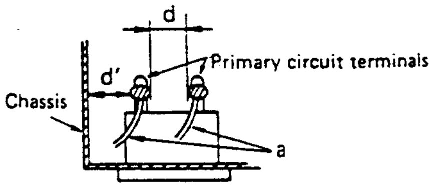


Fig. 8

Table 1: Ratings for selected areas

AC Line Voltage	Region	Insulation Resistance	Dielectric Strength	Clearance Distance(d),(d')
100 V	Japan	≧ 1 MΩ/500 V DC	1 kV 1 minute	≧ 3 mm
110 to 130 V	USA & Canada	– – –	900 V 1 minute	≧ 3.2 mm
* 110 to 130 V 200 to 240 V	Europe Australia	≧ 10 MΩ/500 V DC	4 kV 1 minute	≧ 6 mm (d) ≧ 8 mm (d') (a: Power cord)

* Class Π model only.

Note. This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

4. **Leakage current test**

   Confirm specified or lower leakage current between B(earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

   Measuring Method: (Power ON)
   Insert load Z between B(earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure and following table.

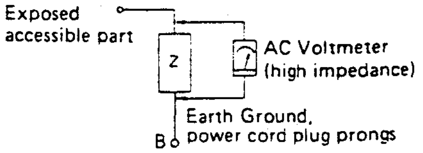
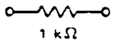
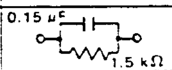
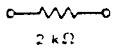
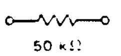

Exposed accessible part
Z
AC Voltmeter (high impedance)
Earth Ground, power cord plug prongs
B

Fig. 9

Table 2: Leakage current ratings for selected areas

AC Line Voltage	Region	Load Z	Leakage Current (i)	Earth Ground (B) to:
100 V	Japan		i ≦ 1m A rms	Exposed accessible parts
110 to 130 V	USA & Canada		i ≦ 0.5m A rms	Exposed accessible parts
110 to 130 V 200 to 240 V	Europe Australia		i ≦ 0.7 m A peak i ≦ 2 m A dc	Antenna earth terminals
			i ≦ 0.7 m A peak i ≦ 2 m A dc	Other terminals

Note. This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

OPERATING INSTRUCTIONS

VHS

Only cassettes marked "VHS" can be used with this video cassette recorder.

Thank you for purchasing the NEC N895EG Hi-Fi VHS Colour Video Cassette Recorder. This unit is based on the new Hi-Fi VHS system developed to provide true hi-fi stereo accompaniment to video entertainment. A tremendous array of video features is also incorporated in the N895EG. Learn about all the available features listed in full on the following page and take advantage of them for your total audio-visual enjoyment.

Before using this video recorder, read this instruction booklet carefully so that you will obtain best results from your N895EG.

CONTENTS

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Precautions 7
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Information on the N895EG's audio system 15
Connections 19
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Pre-tuning the built-in tuner 21
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WARNING

1. This set is for exclusive use with the PAL colour system (system B and G).
2. SECAM (system B and G) colour programmes might be recorded in certain areas but there is no interchangeability of these recorded cassette tapes with other PAL-VHS recorders or SECAM-VHS recorders.
3. Please use the exclusive SECAM-VHS recorder in SECAM broadcasting areas.
4. Please use only PAL prerecorded cassette tapes or PAL signals which have been recorded with the PAL-VHS system.
5. For camera recording, connect a video camera built to the PAL standard.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

CAUTION

Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the AC outlet prior to connecting or disconnecting any signal lead or aerial.

MAINS POWER SWITCH

The mains switch is located on the rear connector panel. Setting this switch to OFF removes all applied power from the set including the timer clock. Switching on or off the recorder section is performed with the secondary power switch, labelled OPERATE, on the front panel.

IMPORTANT: It is permissible to record television programmes only in the event that third party copyrights and other rights are not violated.

NOTE: The rating plate and the safety caution are on the rear of the unit.

CAUTION: When you are not using the N895EG for a long period of time, it is recommended that you disconnect the power cord from AC outlet.

FEATURES

Hi-Fi stereo video recorder conforming to the VHS format, assuring high-quality sound recording and playback with independent rotary audio heads exclusively for hi-fi audio recording and playback.

SP (Standard Play) and LP (Long Play) recording and playback.

Variable-speed playback from 1/40 to 9 times normal in both directions in SP and LP modes.

Auto-scan tuning with channel up/down buttons.

Segment recording for 30 minutes in length or multiples of 30 minutes up to 4 hours; fine-adjustable up to 4 hours 59 minutes using timer setting buttons.

Stereo and bilingual reception indicators.

Double-flap, motorised front cassette loading system.

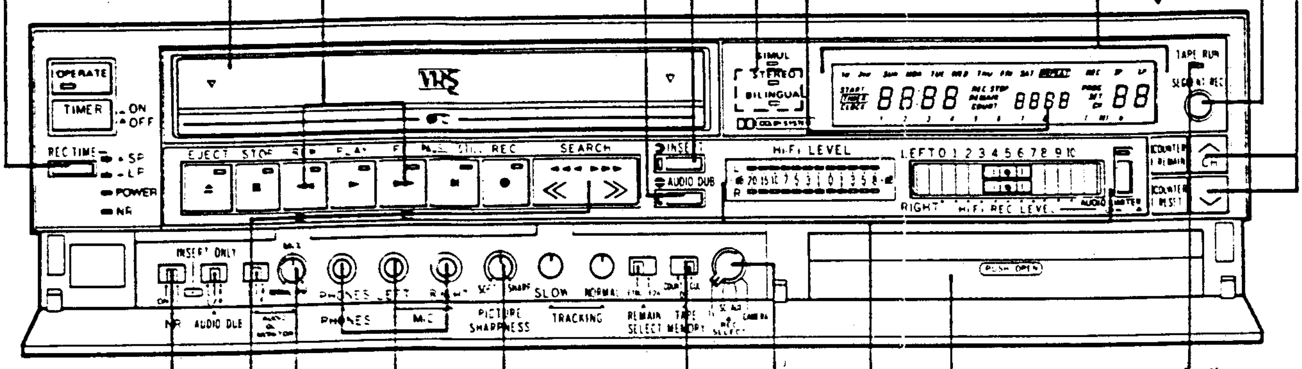
Flexible audio dubbing onto longitudinal audio tracks; right channel only, left channel only, or both channels.

Voltage synthesizer wide-band sound-multiplex tuner with 32-channel storage capacity.

Comprehensive fluorescent display.

Picture Search at 9 times normal speed in either direction in both SP and LP modes.

Tape counter switchable to tape remaining length indicator.



Tape run indicator.

Picture sharpness control.

Microphone and headphone jacks provided.

Glide-out control panel
- 14-Day/8-event programmable timer with memory backup time of about 60 minutes; recording mode (SP or LP) is also memorised for each programme.

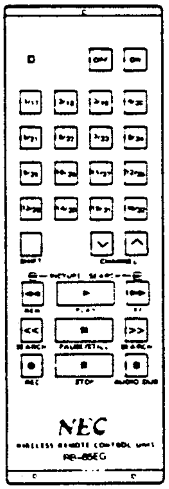
Selectable audio monitoring; hi-fi stereo or longitudinal audio tracks or both mixed (useful for listening to hi-fi stereo together with dubbed narration, for example).

Multi-LED level indicators for right and left channels for hi-fi audio recording; hi-fi audio recording level controls also provided.

Insert editing function to replace part of the prerecorded tape with a new recording.

Recording of FM simulcast TV programmes (in areas where such programmes are broadcast) through use of an FM receiver (with TV sound recorded on the longitudinal audio tracks and FM radio sound recorded in hi-fi stereo). The same switch position allows FM stereo broadcasts to be recorded independently of TV programmes.

Two-channel longitudinal audio tracks with switchable Dolby* noise reduction for compatibility with conventional stereo VHS equipment.



Full-function infrared remote control unit; with 16 random-access channel select keys.

Counter search and cue search mechanism.

- Audio-only recording of up to 8 continuous hours — never possible with audio cassette tapes — on the hi-fi audio track.
- Double-gap integrated 4-head system for video recording — ensures high picture quality in both SP and LP modes and enables noise-free field-still and slow-motion playback (SP).
- Microprocessor-controlled stable and noise-free still and slow-motion playback by single-field scanning method (SP).
- Automatic backspace recording for assemble edits.
- Automatic rewind at the end of tape.
- Dimmer control provided on the glide-out control panel.
- Dynamic Aperture Control circuit to give recordings greater clarity.
- Camera connector provided on the rear panel for direct camera connection.
- 21-Pin Peri connector for A/V connection to a stereo television.
- Slim-line, low-profile design — only 105 mm in height.

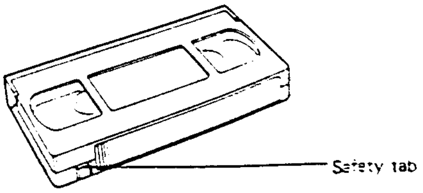
PRECAUTIONS

Handling and storage

- Avoid using the recorder under the following conditions:
  - extremely hot, cold or humid places,
  - dusty places,
  - near appliances generating strong magnetic fields,
  - places subject to vibrations, and
  - poorly ventilated places.
- Be careful of moisture condensation.
  Avoid using the recorder immediately after moving from a cold place to a warm place or soon after heating a room which was cold. The water vapor in warm air will condense on the still-cold video head drum and tape guides and may cause damage to the tape and the recorder.
- Handle the recorder carefully.
  - Do not block the ventilation openings.
  - Do not place anything heavy on the recorder.
  - Do not place anything which might spill and cause trouble on the top cover of the recorder.
  - Use in horizontal (flat) position only.
- In case of transportation,
  - Avoid violent shocks to the recorder during packing and transportation.
  - Before packing, be sure to remove the cassette from the recorder.

Video cassettes

- This recorder employs VHS-type cassettes only.
  E-240 for 4 or 8 hours, E-180 for 3 or 6 hours, E-120 for 2 or 4 hours, E-60 for 1 or 2 hours and E-30 for 30 minutes or 1 hour of recording.
- Video cassettes are equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording cannot be performed. If you wish to record on a cassette whose tab has already been removed, use adhesive tape to block the hole.



- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid extreme humidity, violent vibrations or shocks strong magnetic fields (near a motor, transformer or magnet) and dusty places.
- Place the cassettes in cassette cases and position vertically.

> CAUTION:
> Do not bring cassettes near the magnets used for closing the sub-control panel cover.

* Dolby noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.
Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

Moisture condensation

- If you pour a cold liquid into a glass, water vapor in the air will condense on the surface of the glass. This is called moisture condensation.
- Moisture condensation on the head drum, one of the most crucial parts of the video recorder, will cause damage to the tape.
- Moisture in the air will condense on the recorder when you move it from a cold place to a warm place, after heating a cold room or under extremely humid conditions.
- This recorder is equipped with a moisture condensation prevention circuit which automatically heats the head drum according to the ambient temperature. This circuit operates only when the unit is plugged into an AC outlet, the rear panel MAINS POWER switch is set to ON and the front panel OPERATE button is in the OFF position.
- The moisture condensation prevention circuit consumes only a slight amount of power. However, if for some reason you are not using the recorder for a long period of time, it is advisable to remove the power cord from the AC outlet or set the rear panel MAINS POWER switch to OFF.
- Since the moisture condensation prevention circuit cannot evaporate existing moisture condensation immediately after the power cord has been plugged into the AC outlet, you must allow for about 2 hours if the recorder is to be used in such areas as would occasion moisture condensation.

Operation

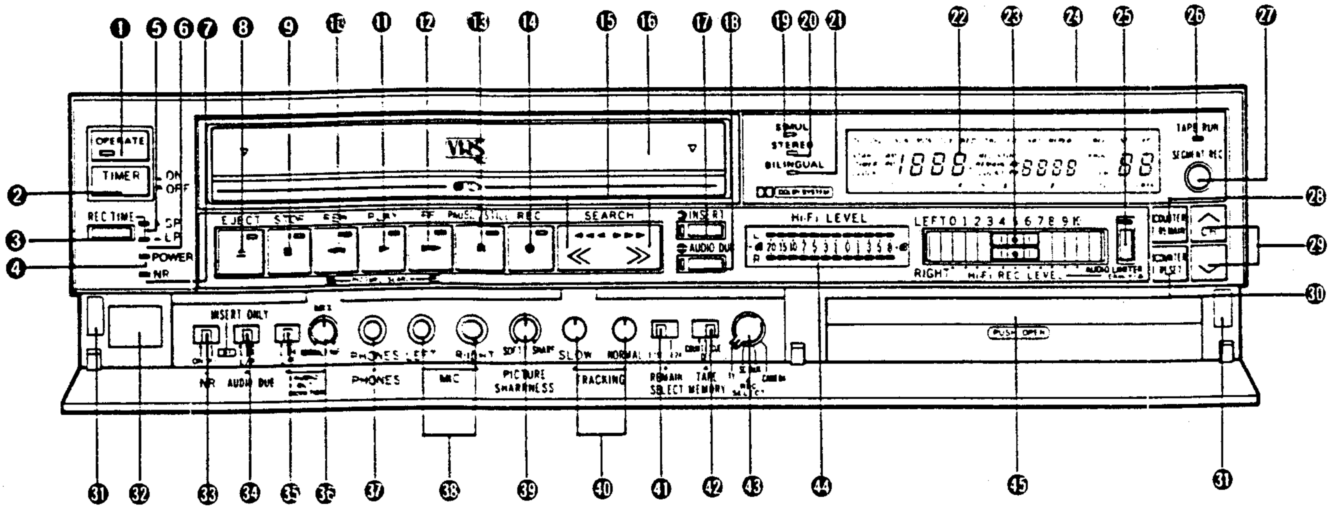
- The cassette can be loaded only when the recorder is powered (with the front panel OPERATE button in the ON position). Do not force the cassette into the slot with the power off.
- When the rear panel MAINS POWER switch is set to ON after it has been set to OFF once, the recorder section cannot be powered even though the front panel OPERATE button has remained in the ON position. In such a case, first press the OPERATE button to OFF and then press it to ON.
- If you wish to operate the recorder locally after you have switched the power off via the remote control unit, first press the OPERATE button to OFF and then press it to ON again.
- As long as the OPERATE button is in the ON position, switching the recorder on or off can be performed via the remote control unit.

Remote control unit

- Avoid violent shocks, especially take care not to drop the unit.
- Take care not to allow liquid to spill into the unit.
- Do not place heavy objects on the unit.
- Avoid leaving the unit in places subject to direct sunlight or extremely high temperatures.

CONTROLS, INDICATORS AND CONNECTORS

Front panel


①
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OPERATE
TIMER
ON
OFF
REC TIME
SP
LP
POWER
NR
EJECT
STOP
REW
PLAY
FF
PAUSE/STILL
REC
SEARCH
INSERT
AUDIO DUB
STEREO
BILINGUAL
Hi-Fi LEVEL
TAPE RUN
SEGMENT REC
INSERT ONLY
NR
AUDIO DUB
PHONES
LEFT
RIGHT
MIC
PICTURE SHARPNESS
SOFT
SHARP
SLOW
NORMAL
TRACKING
REMAIN SELECT
TAPE MEMORY
PUSH OPEN
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① **OPERATE button**
Press to apply power to the recorder. The indicator will light.

② **TIMER button**
Press to ON (▬) after you have preset the timer for unattended recording.

③ **SP/LP recording mode select button (REC TIME)**
Leave the button in its 'out' position (▙) when you wish recordings to be made in the SP (Standard Play) mode. When you wish to record longer TV shows or for unattended and prolonged recording of a number of TV shows with a combined time of up to 8 hours, press this button to LP (Long Play).

④ **POWER indicator**
This red LED lights when the rear panel MAINS POWER switch is set to ON and the front-panel OPERATE button is OFF.

⑤ **SP mode indicator**
Lights when the REC TIME button ③ is in the SP position (▙) during recording. In playback, it automatically lights when an SP recording is played back regardless of the switch setting.

⑥ **LP mode indicator**
Lights when the REC TIME button ③ is in the LP position (▬) during recording. In playback, it automatically lights when an LP recording is being played back regardless of the switch setting.

⑦ **NR indicator**
Lights when the DOLBY NR switch ㉝ is set to ON. (Unrelated to hi-fi audio.)

⑧ **Cassette EJECT button**

⑨ **STOP button**
To stop the tape.

⑩ **REW/PICTURE SEARCH button**
To rewind the tape, press this button while in the Stop mode. To view the speeded-up picture in the reverse direction for programme search, hold this button pressed while in the Play mode.

⑪ **PLAY button**
Press to play back the tape or cancel the Pause/Still mode and variable-speed Search playback mode. Also press this button together with the REC button ⑭ for recording or with AUDIO DUB button ⑱ for audio dubbing.

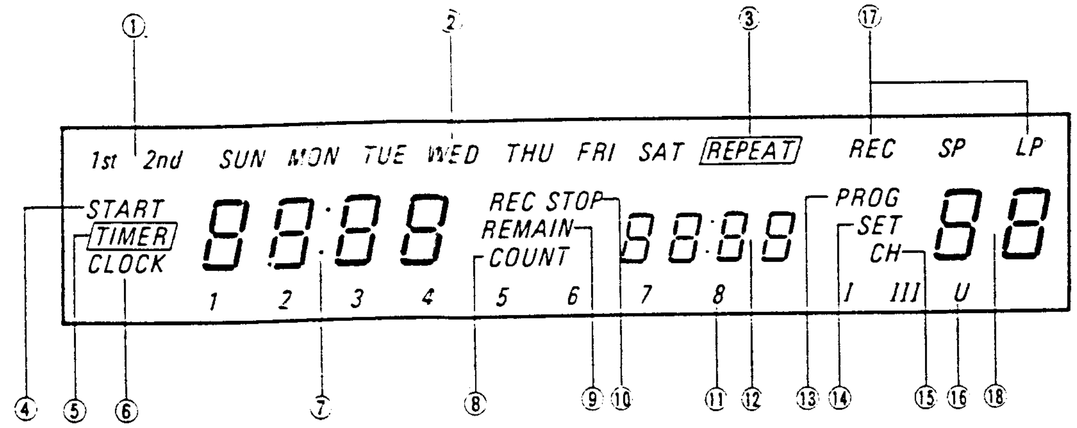
⑫ **FF/PICTURE SEARCH button**
To fast forward the tape, press this button while in the Stop mode. To view the speeded-up picture in the forward direction for programme search, hold this button pressed while in the Play mode.

⑬ **PAUSE/STILL button**
Press to stop the tape temporarily to avoid recording of unwanted material or to view a still picture. The still picture can be advanced in a frame-by-frame manner each time this button is pressed.

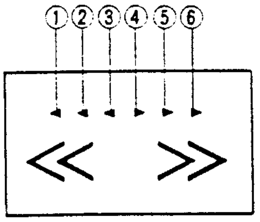
⑭ **Record button (REC)**
Press together with the PLAY button ⑪ for video and audio recording.

⑮ **Variable-speed SEARCH button**
Press either the "≪" or "≫" side of this button to search for a specific segment of the programme at variable speeds; "≪" in the reverse direction and "≫" in the forward direction. Each time this button is pressed while in the Play mode, the speed changes in the sequence of 1/40, 1/20, 1/10, 1/5 (these speeds are useful for slow-motion playback), x1, x3, x5 and x9 (these speeds are useful for

㉒



quick viewing or searching for a specific section). No audio is available in this variable-speed Search mode. When the button is pressed continuously, the speed changes automatically from 1/40 to x9. To cancel the variable-speed Search mode, press the PLAY button ⑪



LEDs ① through ③ light when the tape is running in the reverse direction; ① at speeds of x5 and x9, ② at speeds of x1 and x3, and ③ at slow-motion speeds (from 1/40 to 1/5). LEDs ④ through ⑥ light when the tape is running in the forward direction; ④ at slow-motion speeds (from 1/40 to 1/5), ⑤ at speeds of x1 and x3, and ⑥ at speeds of x5 and x9.

⑯ Cassette loading slot
Insert a VHS video cassette. The door will close and the indicator showing that a cassette is inside will appear.

⑰ INSERT button
Press this button for insert editing. See pages 35 and 36.

⑱ AUDIO DUB button
Press this button together with the PLAY button ⑪ for audio dubbing. Audio dubbing is possible only on the longitudinal audio tracks. (Hi-Fi soundtrack cannot be altered.) For more information see page 34.

⑲ SIMUL indicator
Lights when the REC SELECT switch ㊸ is set to SIMUL.

⑳ STEREO indicator
Lights when a stereophonic programme is being received.

㉑ BILINGUAL indicator
Lights when a bilingual programme is being received.

㉒ Fluorescent display section

① Week indicator
"1st" or "2nd" illuminates to show the week for making preset recordings. "1st" stands for the period within one week and "2nd" within the second week from setting.

② Day indicator
Illuminates both for continuous day indication and for day presetting for future recordings.

③ REPEAT indicator
Illuminates when the REPEAT button (5 of ㊺) is pressed to show that the entered data for timer recording will be retained for serial recordings.

④ START indicator
Flashes for switch-on time setting.

⑤ TIMER indicator
Illuminates when the TIMER button is pressed to ON (▬) to show that the recorder has been properly preset for timer recording.

⑥ CLOCK indicator
Always illuminates except in the Programme Set mode.

⑦ Clock/Start time display

⑧ COUNT indicator
Illuminates to show that the digits in the display to the right are the counter reading.

⑨ REMAIN indicator
Illuminates to show that the digits in the display to the right are the reading of tape remaining time.

⑩ REC STOP indicator
Flashes or illuminates in the Instant Recording mode. Only STOP flashes for switch-off time setting.

⑪ Programme number indicator
Numerals 1 through 8 illuminate successively each time the PROGRAM button is pressed to show which programme is ready for entry.

⑫ Stop time/Tape remaining time/Counter display/Sweep indicator

⑬ PROG indicator
Flashes to show that the channel is ready to be entered for timer recording.

⑭ SET indicator
Illuminates when the CH SET button (①of ㉓) in the top-panel pre-tuning section is pressed for pre-tuning and flashes during sweep scanning.

⑮ CH indicator
Illuminates to show that the displayed channel is currently being received by the built-in tuner.

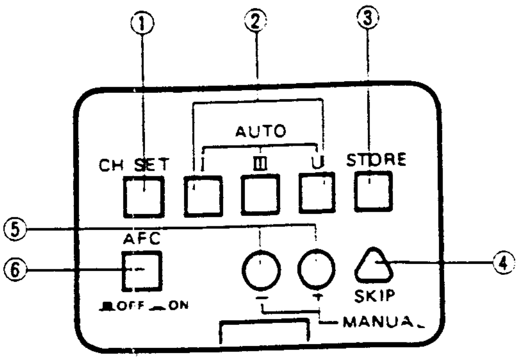
⑯ I, III, U indicator
Flashes when the corresponding AUTO tuning button (②of ㉓) is pressed, showing that sweep scanning of that particular frequency band is being performed. Also functions during manual tuning using the MANUAL "+" or "-" button.

⑰ REC SP and LP indicators
When the SP mode is selected with the REC TIME SP/LP button on the glide-out control panel, REC SP lights; when LP is selected, REC LP lights.

⑱ Channel display
Numerals 1 through 16 are successively displayed to show which channel is selected for recording, timer setting or for pre-tuning.

㉓ Hi-Fi audio recording level controls (Hi-Fi REC LEVEL)
The recording level of hi-fi audio signals can be manually adjusted when the AUDIO LIMITER button ㉕ is in the OFF position. For adjustment, slide these controls referring to the Hi-Fi level indicators. When LEDs up to 0 dB light with the loudest signal being applied, the recording level is optimum.

㉔ Built-in tuner pre-tuning compartment
Open the compartment cover on top of the unit.



① CH SET button
Press this button for pre-tuning the built-in tuner to TV stations in your area. (See pages 21 and 22.)

② AUTO tuning buttons (AUTO I, III, U)
Press one of the buttons corresponding to the band in which you want to perform tuning. Automatic sweep tuning is initiated by pressing the button and stops automatically when a TV station is captured.

③ STORE button
To store the tuned-in station in memory. (See pages 21 and 22.)

④ SKIP button
To skip unused channels. (See page 22.)

⑤ MANUAL tuning buttons (+/-)
For manual tuning to weaker broadcast signals. (See page 18.)

⑥ AFC button
Set to ON to activate the built-in Automatic Frequency Control circuit for fine picture tuning. Normally leave it in the ON position. (See pages 21 and 22.)

㉕ AUDIO LIMITER button

During recording,

with the button ON: (LED lights)	hi-fi audio recording level is automatically adjusted to prevent over-level recordings. (The level indicators do not light.)
with the button OFF: (LED off)	hi-fi audio recording level can be manually adjusted with the slide controls.

During playback,

with the button ON:	Hi-Fi level indicators do not function.
with the button OFF:	hi-fi audio playback level is shown by the level indicators.

- Playback level has no relation to the Hi-Fi REC LEVEL controls.
- The recording level of normal audio signals is always adjusted automatically regardless of the setting of the AUDIO LIMITER button.

㉖ TAPE RUN indicator
Blinks to show the condition of tape running.

㉗ SEGMENT REC button
Use this button to start recording instantly and stop automatically after a predetermined time. (See page 32.)

㉘ COUNTER/REMAINING button
Press to switch the middle 4-digit display from tape counter to tape remaining time display, or vice versa. (See page 26.)

㉙ CHANNEL ∧UP/∨DOWN buttons
Press to tune to preset stations; the "∧ UP" button for scanning in the direction of increasing channel numbers and the "∨DOWN" button in the direction of dereasing channel numbers. The selected channel will appear in the channel display.

㉚ COUNTER RESET button
Press to reset the tape counter reading to "0000".

㉛ Magnets
Exercise care not to bring video cassettes near these magnets.

㉜ Infrared beam receiving window

㉝ Noise reduction switch (DOLBY NR) (for normal audio)
This switch is effective only for the longitudinal audio tracks (there is no need to apply noise reduction to hi-fi audio). Set to ON to activate the built-in Dolby NR circuit to minimise tape hiss. Recordings made with this switch set to ON should be played back with the switch set to ON.

㉞ AUDIO DUB channel select switch (for normal audio)
Selects the normal audio channel(s) to be dubbed.

L/R:	both the left and right channel sounds are replaced with new recordings.
L:	the left channel sound is replaced with a new recording while the right channel sound remains as original.
R:	the right channel sound is replaced with a new recording while the left channel sound remains as original.

This switch also selects the audio channel for insert editing, although the L position does not allow new material to be inserted onto the normal audio channels.

㉟ AUDIO OUT MONITOR switch
Selects the audio channel(s) to be listened to.
When listening to bilingual or stereo programmes, select the desired audio channel. This switch is effective for all audio outputs except from the Hi-Fi AUDIO OUT connectors.

L:	to listen to the sound on the left channel track (main soundtrack of a bilingual programme).
L/R:	to listen to the sound from stereo tapes. (The audio output from the RF OUT terminal is monaural. Therefore, if only the RF OUT connection is made, the mixed sound of both channels is heard when this switch is set to L/R.)
R:	to listen to the sound on the right channel track (sub soundtrack of a bilingual programme).

For more information about audio tracks, refer to pages 15 through 18.

㊱ AUDIO OUT MONITOR control (Audio mixing volume control)

Adjusts the relative level of hi-fi and normal audio of the audio output except from the Hi-Fi AUDIO OUT connectors. Turn it fully clockwise toward Hi-Fi to listen to the hi-fi audio tracks only; fully counterclockwise toward NORMAL to listen to the longitudinal audio tracks only. In between the two, mixed sound of them can be listened to at corresponding levels. Using this function, it is possible to enjoy hi-fi audio while at the same time listening to a narration dubbed onto the longitudinal audio tracks.

㊲ Headphone jack (PHONES)

Connect a set of headphones for monitoring or private listening. The headphone output level is switchable with a switch on the bottom of the unit. (See page 13.)

㊳ MIC jacks (LEFT, RIGHT)

Connect microphones for stereo recordings.

- When a microphone is plugged into the LEFT jack only, the same sound is recorded on both channels.
- When a microphone is plugged into the RIGHT jack only, the sound is recorded on the right channel.
- With a microphone connected to each jack, stereo recordings are possible.

㊴ PICTURE SHARPNESS control

Turn this knob clockwise to make the picture sharper. Turn counterclockwise to give the picture a softer tone. Effective only for playback pictures. (No effect for recording.)

㊵ TRACKING controls

Use these controls to minimise noise bars, if observed during playback.

SLOW: during slow-motion playback.

NORMAL: during normal-speed playback.

If noise or breaks are heard in the hi-fi audio soundtrack during normal-speed playback, attempt to correct it with the NORMAL TRACKING control.

㊶ REMAIN SELECT switch (E240/E180)

In order for the tape remaining time counter to give the correct information, it is necessary to set this switch correctly.

E240: set to this position when using an E-240 cassette.

E180: set to this position when using a cassette other than E-240.

㊷ TAPE MEMORY switch

Two search modes are available; COUNT search and CUE search.

When the switch is set to COUNT, the tape stops automatically at the counter reading of nearly "0000" during fast forward and rewind. When the switch is set to CUE, the tape stops automatically at a point where a new recording was made, during either rewind or fast forward by sensing the cue signal. Refer to page 26. Normally set this switch to OFF.

㊸ REC SELECT switch

For selecting the recording input signal.

TV: To record signals coming from the built-in tuner.

SIMUL: To record the video signal and normal audio signal from the built-in tuner and the hi-fi audio signal from the rear panel AUDIO LINE IN connectors. When recording FM simulcast TV programmes (if broadcast), use this position.

AUX: To record signals coming from a unit connected to the rear panel VIDEO IN and AUDIO LINE IN connectors.

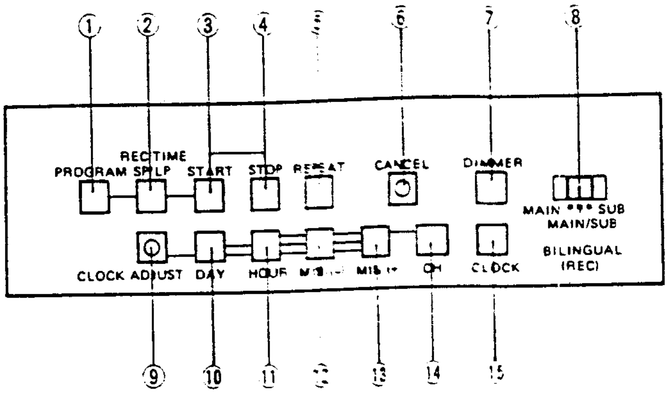
CAMERA: To record signals coming from a camera connected to the rear panel CAMERA connector.

㊹ Hi-Fi audio level indicators

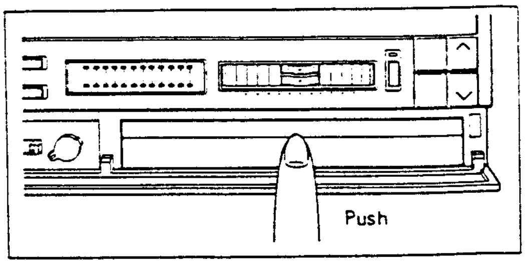
These indicators, one for left channel and one for right channel, show the recording level of hi-fi audio signals. During playback, these show the playback level of hi-fi audio signals only when the AUDIO LIMITER button ㉕ is OFF (▲).

㊺ Clock/timer setting and bilingual recording select section (PUSH-OPEN)

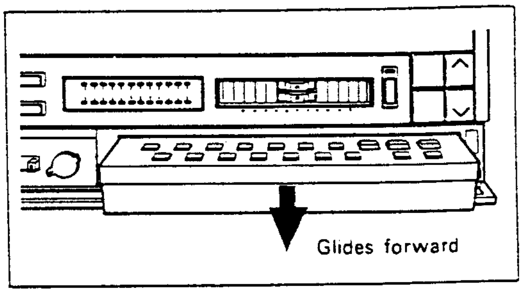
This section glides forward when slight pressure is applied to the portion labelled PUSH-OPEN. To retract this section, push back with finger.



1



2



① **PROGRAM button**
Press this button when you want to preset the timer for unattended recording. The entire display will change to the Programme Set mode, with numeral 1 illuminated at the bottom of the display. This shows that programme memory No. 1 is ready to accept entries. To change the programme number, press this button until the number of the programme memory you want to use illuminates.

② **REC TIME SP/LP button**
The recording mode can be programmed independently for each preset programme for timer recording.
SP: 4 hours with an E-240 cassette.
LP: 8 hours with an E-240 cassette.

③ **START button**
Press for setting the day and switch-on time for automatic timer recording.

④ **STOP button**
Press for setting the switch-off time for automatic timer recording.

⑤ **REPEAT button**
After you have entered all data for each programme for unattended recording, if you wish the entered data to be kept for serial recording, press this button.

⑥ **CANCEL button**
Press this button to cancel or "clear" the preset data.

⑦ **DIMMER button**
The brightness of the display can be subdued by pressing this button.

⑧ **BILINGUAL (REC) select switch**
For selecting the desired soundtrack when recording bilingual programmes.

MAIN:	Main soundtrack (local language) will be recorded on both channels.
MAIN/SUB:	Main soundtrack (local language) will be recorded on the left channel and the sub soundtrack (foreign language) will be recorded on the right channel.
SUB:	Sub soundtrack (foreign language) will be recorded on both channels.

⑨ **CLOCK ADJUST button**
Hold this button pressed for clock setting.

⑩ **DAY button**
Press until a desired day indication appears on the display for clock and timer settings.

⑪ **HOUR button**
Press to obtain a desired hour indication for clock and timer settings. Can also be used for fine adjustment of time for instant recording.

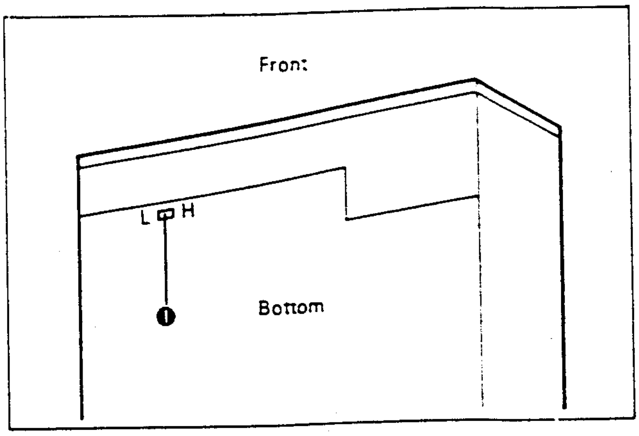
⑫ **MIN(-) button**
Press to decrease the minute indication for clock and timer settings. Can also be used for fine adjustment of time for instant recording.

⑬ **MIN(+) button**
Press to increase the minute indication for clock and timer settings. Can also be used for fine adjustment of time for instant recording.

⑭ **Channel button (CH)**
Press this button and then use the CHANNEL buttons ㉙ to obtain a desired channel indication on the display in the Programme Set mode.

⑮ **CLOCK button**
Press this button to change the display from the Programme Set mode to the Clock mode.

Bottom Panel


Front
L
H
Bottom
❶

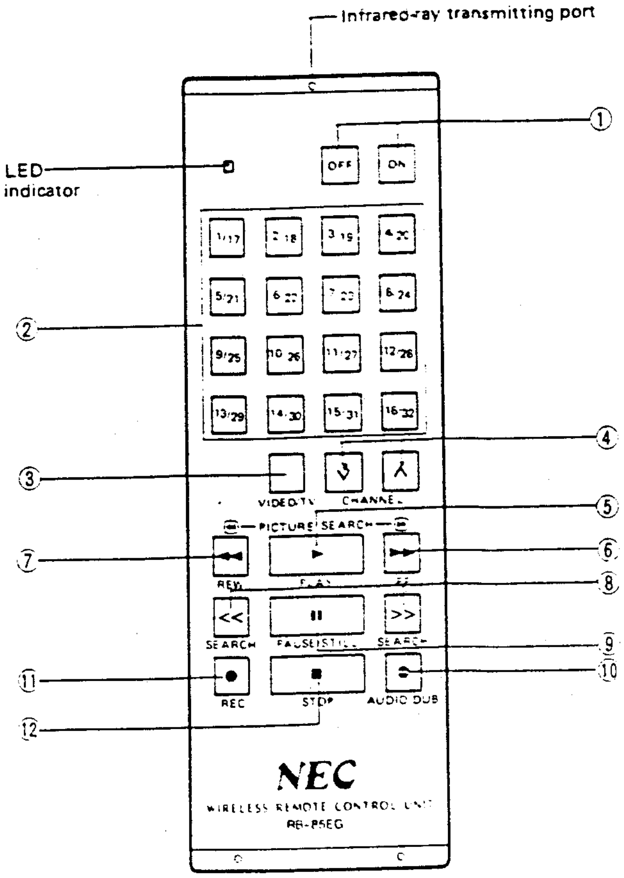
❶ Headphone output level select switch

H: High output.
L: Low output.

Before shipment, this switch has been set to H. If the headphone volume is too loud, reset it to L.

Infrared remote control unit

The infrared remote control unit gives you full operation control from your viewing position. The maximum operating distance is about 8 m.


Infrared-ray transmitting port
LED indicator
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫
OFF
ON
1/17
2/18
3/19
4/20
5/21
6/22
7/23
8/24
9/25
10/26
11/27
12/28
13/29
14/30
15/31
16/32
VIDEO/TV
CHANNEL
PICTURE SEARCH
REW
PLAY
FF
SEARCH
PAUSE/STILL
SEARCH
REC
STOP
AUDIO DUB
NEC
WIRELESS REMOTE CONTROL UNIT
RB-P5EG

① **Power ON/OFF buttons**
To switch power on or off for the recorder. (The OPERATE button of the recorder should be ON.)

② **Channel number buttons**
These buttons are used to call up the desired TV programme channel. (On the recorder the CHANNEL ∧UP/∨ DOWN buttons ㉓ perform this same function.)
The channel number will be displayed on the channel display section of the recorder's fluorescent display.

③ **VIDEO/TV button**

④ **CHANNEL select buttons (∧/∨)**
Use these buttons for sequential channel selection.

⑤ **PLAY button**

⑥ **FF/PICTURE SEARCH button**

⑦ **REW/PICTURE SEARCH button**

⑧ **Variable-speed SEARCH buttons**

⑨ **PAUSE/STILL button**

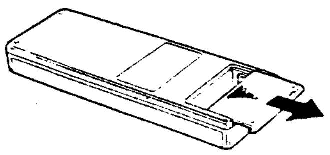
⑩ **AUDIO DUB button**

⑪ **Record button (REC)**

⑫ **STOP button**

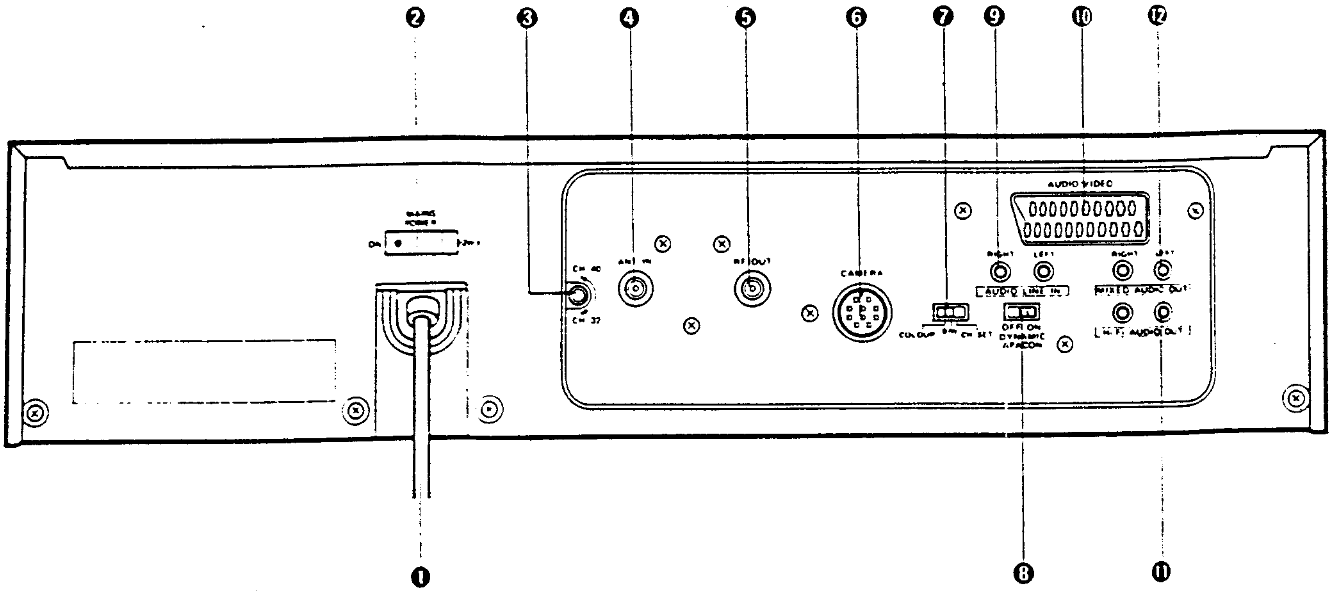
Installing the batteries

1. Slide the battery compartment cover on the rear of the unit in the direction of the arrow (▶).



2. Insert 2 "R6"-size batteries (provided) in the correct directions into the battery compartment.
3. Replace the cover.

Rear panel



❶ AC power cord

❷ MAINS POWER switch

Setting this switch to ON applies mains power to the set. To switch off the set completely, set the MAINS POWER switch to OFF. This switches off the timer/clock circuit and cancels all the preset programming data after the memory backup time (about 60 minutes) has elapsed. This also switches off the built-in aerial circuit so that the TV receiver connected to the recorder will not be able to receive off-the-air TV programmes for good viewing condition. Normally set this MAINS POWER switch to ON.

❸ RF converter frequency adjustment screw

See page 18.

❹ Aerial input connector (ANT IN)

Connect an aerial to this connector.

❺ RF OUT connector

Connect to the aerial terminal of a TV receiver through the aerial cable provided.

❻ CAMERA connector

Connect a video camera (with a power consumption of less than 8 watts) directly to this connector using a 10-pin camera cable.

Caution: Some cameras may not be electronically compatible, even though the same type of connector is used.
Consult your dealer.

❼ Video mode select switch

This applies to both recording and playback.

COLOUR:	Set to this position when the input or playback video signal is in colour.
B/W:	Set to this position when the input or playback video signal is monochrome.
CH SET:	Set to this position when tuning your TV receiver for the "Video channel"

❽ Dynamic aperture control switch (DYNAMIC APACON)

This switch has been preset to ON before shipment.

Normally leave this switch in its ON position. This will provide recordings with greater clarity. However, it is recommended that the switch be set to OFF if the off-air signal strength is weak or when dubbing from a tape with an inferior signal-to-noise ratio. For evaluation, make a test recording and play it back. If the playback picture looks coarse (grainy), set the switch to OFF.

❾ AUDIO LINE IN connectors

Connect an audio tape recorder or other audio sources for recording sound.

❿ AUDIO/VIDEO socket

A 21-pin standardised audio/video input/output socket for the connection to a stereo TV equipped with the same type of socket.

⓫ Hi-Fi AUDIO OUT connectors

Hi-fi audio signals being recorded or played back are available from these connectors.

- These connectors deliver the audio signals directly from the hi-fi audio tracks regardless of the settings of the AUDIO OUT MONITOR control and switch.

⓬ MIXED AUDIO OUT connectors

Both hi-fi and normal audio signals can be obtained from these connectors. The relative level of the signals can be adjusted with the front panel AUDIO OUT MONITOR control ㉟

INFORMATION ON THE N895EG'S AUDIO SYSTEM

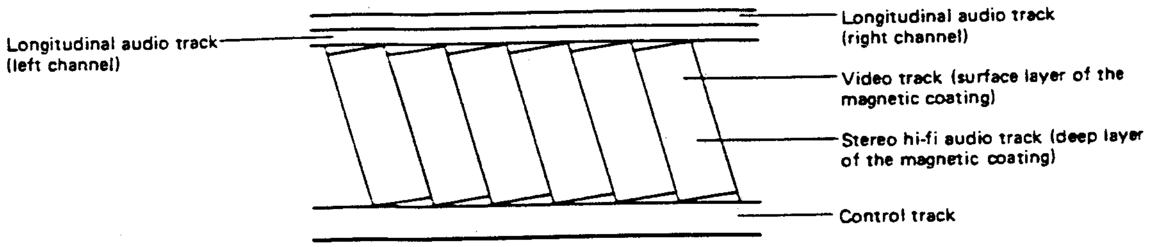
Hi-Fi and normal audio

To provide true hi-fi audio accompaniment to video entertainment and, at the same time, compatibility with regular VHS tapes, the N895EG employs a newly-developed audio recording system. Hi-fi audio signals (2-channel) are recorded deep into the tape's magnetic coating, and the video signal is recorded on top of the audio signals in a shallower layer. At the same time, another audio head records normal audio (2-channel) onto the usual longitudinal audio tracks. Since these longitudinal audio tracks are exactly the same as on regular stereo VHS tapes, tapes recorded on the N895EG can be played back on other stereo VHS machines, and vice versa.

Also, these longitudinal tracks can be replaced later with new recordings through audio dubbing so that more personal and creative soundtracks can be produced.

CAUTION:
The hi-fi soundtrack recorded with the N895EG cannot be reproduced with video equipment other than Hi-Fi VHS.

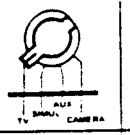
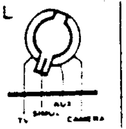
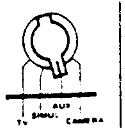
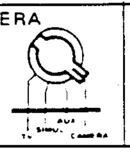
Tape pattern recorded with the N895EG


Longitudinal audio track
(left channel)
Longitudinal audio track
(right channel)
Video track (surface layer of the magnetic coating)
Stereo hi-fi audio track (deep layer of the magnetic coating)
Control track

Hi-fi audio recording and reproduction are available only from the hi-fi audio track while the longitudinal audio tracks provide normal audio.

The hi-fi and normal soundtracks are recorded simultaneously, and audio dubbing is applicable only to the normal audio.

Recording options depending on the setting of the REC SELECT switch

REC SELECT switch position	Recorded signals		
	Video track	Normal audio track (2-channel)	Hi-Fi audio track (2-channel)
TV 	TV picture (from built-in tuner)	TV sound (from built-in tuner)	
SIMUL 	TV picture (from built-in tuner)	TV sound (from built-in tuner)	Audio signal from AUDIO LINE IN
AUX 	Video signal (from AUDIO/VIDEO)	Audio signal from AUDIO/VIDEO	
CAMERA 	Video signal from camera	Audio signal from camera	

Notes:

- Do not leave microphone(s) connected to the MIC jacks unless needed; microphone input will always be mixed with the audio signals on hi-fi or normal audio tracks. (Only when the REC SELECT switch is in the SIMUL position, the normal audio tracks are not affected by the microphone input.)
- When a microphone is plugged into the LEFT jack only, the same sound is recorded on both channels, while with a microphone connected to the RIGHT jack only, the sound is recorded on the right channel only. For stereo recording, connect two microphones.

To use the N895EG as an audio tape deck

You can record only audio (without recording any video signal) on the hi-fi audio track. This means you can record a continuous 8-hour FM programme onto a single cassette (E-240). For this purpose, set the REC SELECT switch to SIMUL and tune the built-in tuner to a vacant channel.

Recording options depending on the setting of the BILINGUAL (REC) switch

In addition to regular TV broadcasts (with monaural audio), stereo or bilingual programmes are being broadcast with increasing frequency in certain countries. To accommodate these different types of broadcast, the N895EA incorporates a sound-multiplex tuner to make the most of its 2-channel audio capability.

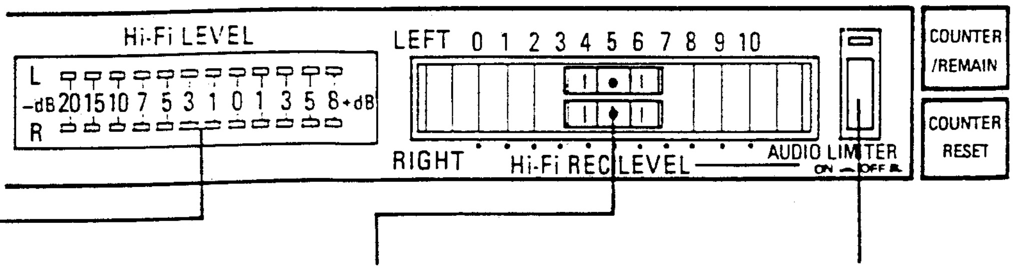
BILINGUAL (REC) switch position	Recorded soundtracks		
	Monaural programmes	Stereo programmes	Bilingual programmes
MAIN MAIN• • •SUB MAIN/SUB	The same monaural sound recorded on both channels regardless of the switch position.	Recorded in stereo regardless of the switch position.	Local-language soundtrack recorded on both channels
MAIN/SUB MAIN• • •SUB MAIN/SUB			Local and foreign-language soundtracks recorded
SUB MAIN• • •SUB MAIN/SUB			Foreign-language soundtrack recorded on both channels

Note:

- The selected soundtrack is recorded on both hi-fi and normal audio tracks when the REC SELECT switch is set to TV, or on the normal audio track when the REC SELECT switch is set to SIMUL. The BILINGUAL (REC) switch has no effect when the REC SELECT switch is set either to AUX or CAMERA.

Hi-Fi audio recording level adjustment

While recording onto the normal audio track is controlled by the built-in Automatic Level Control circuit, hi-fi audio recording has two control options: manual and automatic.



Hi-Fi audio level indicators
For manual control of the recording level, slide the Hi-Fi REC LEVEL controls referring to these indicators. When LEDs up to 0 or 1 dB light for the loudest signal being applied, the recording level is optimum.
During playback, these indicators show the level of hi-fi audio signals recorded on the tape.
These indicators do not light when the AUDIO LIMITER button is in the ON position.

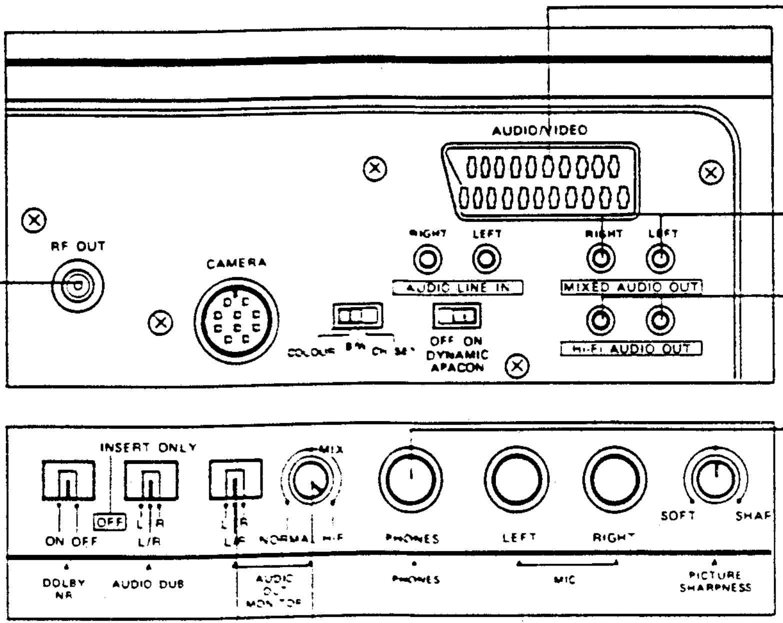
Hi-Fi REC LEVEL controls
Slide these controls, the upper for left channel and the lower for right channel, for manual adjustment of the hi-fi audio recording level.

AUDIO LIMITER button
Pressing this button to ON (▬) activates the built-in audio limiter circuits for both channels so that the recording level is automatically controlled. For manual adjustment, press this button to OFF (▲). (The recording level for normal audio is always controlled automatically regardless of the setting of this button.)

Dual-audio 2-channel playback flexibility

Two different types of audio tracks (hi-fi and normal) and 2-channel recording and playback circuitry allow a variety of playback options depending on the connection and the settings of relevant controls and switches.

RF OUT connector
Delivers audio (both hi-fi and normal) and video signals to a TV receiver. When the recorder is not used, the aerial signal is supplied from this connector to the TV receiver to allow regular TV viewing; stereo, bilingual or monaural programmes are all delivered in the form they are broadcast. However, when a video tape is played back through the RF OUT connector (with the TV's channel selector set to UHF channel 36), the audio is reproduced always as monaural; with stereo tapes, both channels are mixed and with bilingual tapes, the soundtrack selected by the AUDIO OUT MONITOR switch is reproduced. Therefore, for stereo playback, connect a stereo system to the Hi-Fi AUDIO OUT or MIXED AUDIO OUT connectors. Or connect a stereo TV set to the AUDIO/VIDEO socket.



AUDIO/VIDEO socket
Delivers the audio signals from both hi-fi and normal audio tracks, as well as the video signal. This socket also carries audio and video inputs.

MIXED AUDIO OUT connectors
Delivers the audio signals from both hi-fi and normal audio tracks.

Hi-Fi AUDIO OUT connectors
Delivers the audio signals from the hi-fi audio track exclusively.

PHONES jack
Delivers the audio signals from both hi-fi and normal audio tracks. The headphone output level is switchable with a switch on the bottom of the unit (see page 11.)

AUDIO OUT MONITOR switch
Selects the channel (left, right or both) for listening. Use this switch when playing back bilingual or stereo tapes.

- Set to L to listen to the main soundtrack of a bilingual programme or the left channel of a stereo programme.
- Set to L/R to listen to a stereo soundtrack.
- Set to R to listen to the sub soundtrack of a bilingual programme or the right channel of a stereo programme.

Notes:

- This switch functions during recording as well, although it has no effect on the recorded signal.
- This switch has no effect on the signal output from the Hi-Fi AUDIO OUT connectors.

AUDIO OUT MONITOR control
Selects hi-fi audio, normal audio or a mixture of the two. This control is effective for signals from all the output connectors except Hi-Fi AUDIO OUT.

- Turn it fully clockwise to listen to hi-fi audio.
- Turn it fully counterclockwise to listen to normal audio.
- Place it any point between NORMAL and Hi-Fi to listen to both audio tracks; the relative level differs depending on the position of this control.

Notes:

- This control functions during recording as well, although it has no effect on the recorded signal.
- When playing back a tape containing the same soundtrack on both hi-fi and normal audio tracks, turn this control fully in either direction. A slight time lag is felt between the two soundtracks in the MIX position.
- This control has no effect on the signal output from the Hi-Fi AUDIO OUT connectors.

Reference chart for audio recording possibilities

Two-channel recording possibilities

"Recorded on" applies to both hi-fi and longitudinal audio tracks, unless otherwise specified.

Setting of the REC SELECT switch / Audio source	TV	SIMUL	AUX	CAMERA
Soundtrack of TV programme		Same as TV, but longitudinal track only.	–	–
Monaural	Recorded on both channels.			
Bilingual	Selected soundtrack(s) recorded on both channels.			
Stereo	Recorded in stereo.			
Camera's built-in mike	–	–	–	Recorded on LEFT channel*.
Recorder's LEFT mike only	Mixed on LEFT and RIGHT channels.	Mixed on LEFT and RIGHT channels. (Hi-fi audio only)	Mixed on LEFT and RIGHT channels.	Mixed on LEFT and RIGHT channels.
Recorder's RIGHT mike only	Mixed on RIGHT channel.	Mixed on RIGHT channel. (Hi-fi audio only)	Mixed on RIGHT channel.	Mixed on RIGHT channel.
Recorder's LEFT and RIGHT mikes	Mixed on the corresponding channels.	Mixed on the corresponding channels. (Hi-fi audio only)	Mixed on the corresponding channels.	Mixed on the corresponding channels.
AUDIO LINE IN LEFT connector only	–	Recorded on LEFT channel. (Hi-fi audio only)	–	–
AUDIO LINE IN RIGHT connector only	–	Recorded on RIGHT channel. (Hi-fi audio only)	–	–
Both AUDIO LINE IN connectors	–	Recorded on the corresponding channels. (Hi-fi audio only)	–	–
AUDIO/VIDEO socket	–	–	Recorded on the corresponding channels.	–

*Depends on the type of camera used. See chart below.

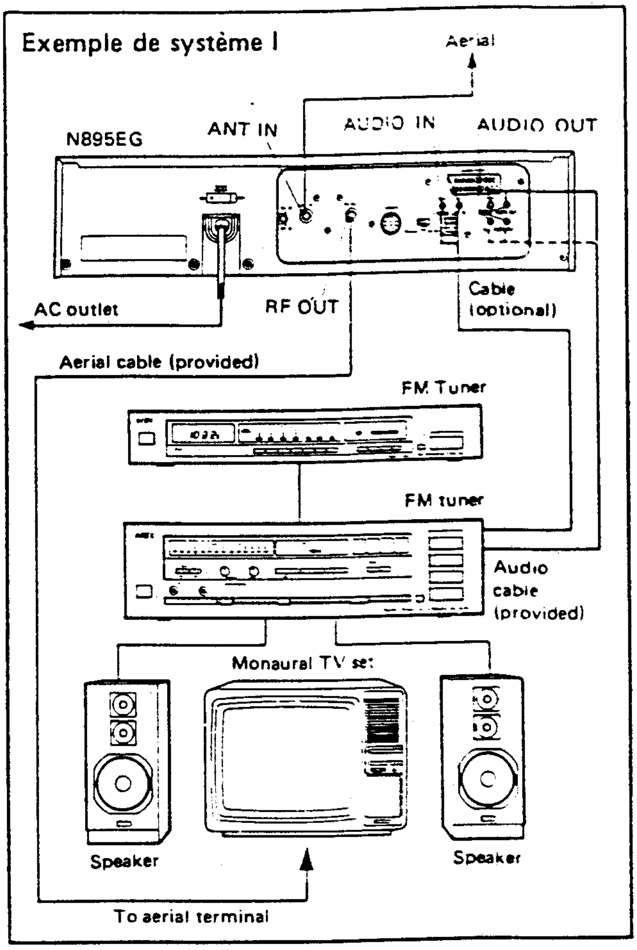
Note:

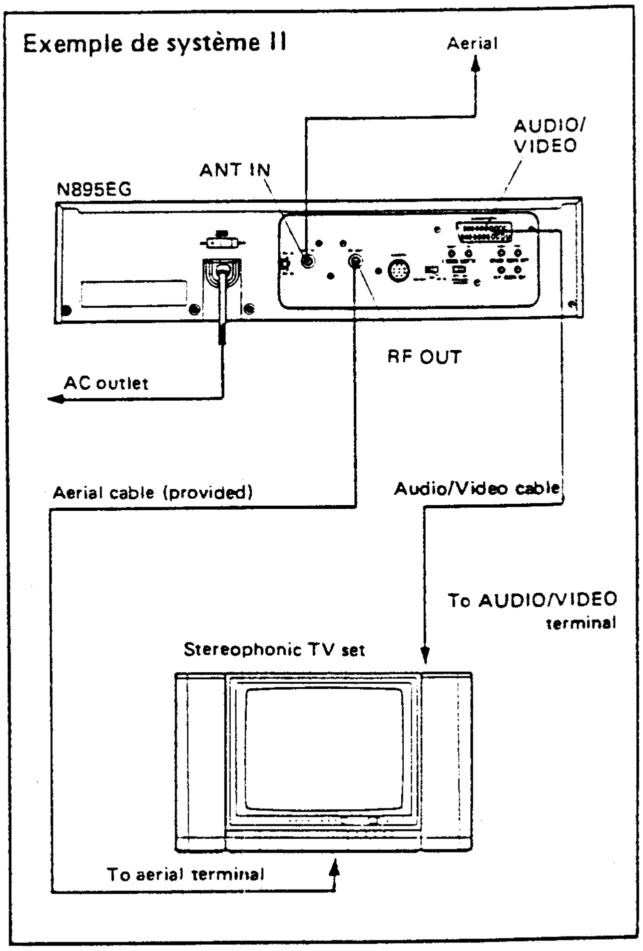
- The same audio recording possibilities except with sources connected to the AUDIO LINE IN connectors apply to audio dubbing (performed only on longitudinal audio tracks). However, the actual dubbing channel can be selected with the AUDIO DUB switch. Audio dubbing is not possible from an audio source connected to the AUDIO LINE IN connectors.

Audio recording possibilities depending on the type of camera and the connection of microphones

Camera	Microphone	Soundtrack
Ordinary video camera	Camera's built-in mike	Recorded on LEFT channel.
	Recorder's LEFT mike	Recorded on LEFT and RIGHT channels. (Sound from camera's built-in mike is mixed on LEFT channel.)
	Recorder's RIGHT mike	Camera's built-in mike is recorded on LEFT channel and recorder's RIGHT mike is recorded on RIGHT channel.
	Recorder's LEFT and RIGHT mikes	Stereo recording. (Sound from camera's built-in mike is mixed on LEFT channel.)
Stereo capable Video camera	Camera's exclusive stereo microphone	Stereo recording. (The mike's STEREO/MONO switch should be in the STEREO position.)
	External monaural mike	Recorded on LEFT channel.
	External stereo mike	Stereo recording.

CONNECTIONS


Exemple de système I
Aerial
N895EG
ANT IN
AUDIO IN
AUDIO OUT
AC outlet
RF OUT
Cable (optional)
Aerial cable (provided)
FM Tuner
FM tuner
Audio cable (provided)
Monaural TV set
Speaker
Speaker
To aerial terminal


Exemple de système II
Aerial
AUDIO/ VIDEO
ANT IN
N895EG
RF OUT
AC outlet
Aerial cable (provided)
Audio/Video cable
To AUDIO/VIDEO terminal
Stereophonic TV set
To aerial terminal

Procedure

1. Remove the aerial cable from the TV receiver and reconnect to the N895EG.
2. Connect the N895EG to the TV receiver using the aerial cable (provided).
3. Connect the AUDIO LINE IN LEFT and RIGHT connectors of the N895EG to the recording output terminals of the amplifier. (Exactly as one hooks up an audio cassette deck.)
4. For audio output connection there is a choice. If you wish to listen to only hi-fi audio, connect the Hi-Fi AUDIO OUT connectors of the N895EG to the AUX IN terminals of the amplifier. If you wish to make your setup ready to deliver both hi-fi and normal audio, use the MIXED AUDIO OUT connectors.

Notes:

- Observe L and R when connecting the audio input and output connectors of the N895EG to a stereo amplifier.
- If stereo or bilingual TV broadcasts are receivable in your area, this recorder can record them independently of the TV set and play them back through the connected audio system.
- When listening to sound from the connected stereo system, turn down completely the sound volume of the TV receiver.
- Listening to stereophonic sound is also possible using stereo headphones connected to the front panel PHONES jack.
- With this setup, you can enjoy prerecorded stereo video tapes in stereo (or hi-fi stereo if they are Hi-Fi VHS tapes) while viewing them on a regular TV receiver, and also you can record FM simulcast television programmes with hi-fi audio accompaniment. See page 28.

CAUTION

- Even when you are not using the recorder, the rear panel MAINS POWER switch should be set to ON in order to be able to view TV broadcast programmes with the illustrated connections.
- The N895EG has a dynamic range of more than 80 dB with regards to its hi-fi audio capability. It is recommended that you check the maximum level if you are going to listen to the hi-fi audio signals through a stereo amplifier. A sudden surge in speaker input may cause speaker damage.
- Some speakers and televisions are specially shielded to prevent television interference. If both are of the non-shielded type, do not place the speakers adjacent to the TV set, otherwise the video playback picture will not be normal because of mutual interference.

For customers who own a stereo TV equipped with a standardised audio/video socket

By connecting the 21-pin AUDIO/VIDEO socket of the N895EG to your TV's audio/video socket, it is possible to play stereo tapes through the TV's speakers. In this case, use an A/V channel specified on your TV, instead of UHF channel 36.

VIDEO CHANNEL SETTING

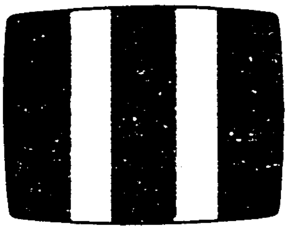
ATTENTION

This adjustment is necessary to pre-tune the built-in tuner (see next page). To view video programmes through the RF OUT terminal, you must set the TV's channel selector to the output channel of the RF converter. To view video programmes through the AUDIO/VIDEO socket, use a channel specified on your TV.

The signal from the RF converter is viewed through a vacant channel not used for broadcasting. The converter channel of all units is set to UHF channel 36 prior to shipment. Setting your TV receiver to UHF channel 36 may provide video playback. However, to obtain the best possible reproduction on your TV receiver, accurate adjustment to the RF converter output is required.

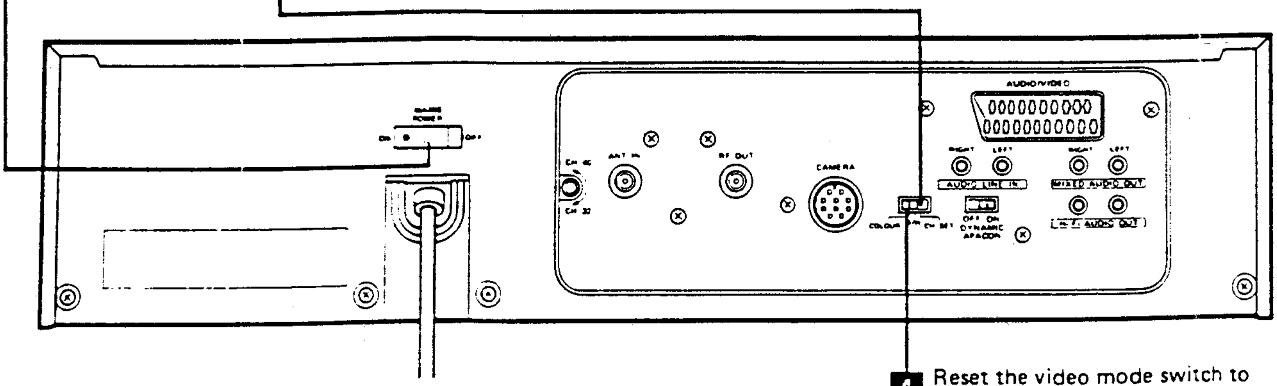
Procedure

1 Set the rear panel MAINS POWER switch to ON and press the front panel OPERATE button to ON. Turn on the TV receiver.



3 Adjust your TV receiver in the vicinity of UHF channel 36 until you bring in the two white signal bars on the screen as illustrated.
This setting is now the VIDEO CHANNEL of the TV receiver to which the N895EG is connected.

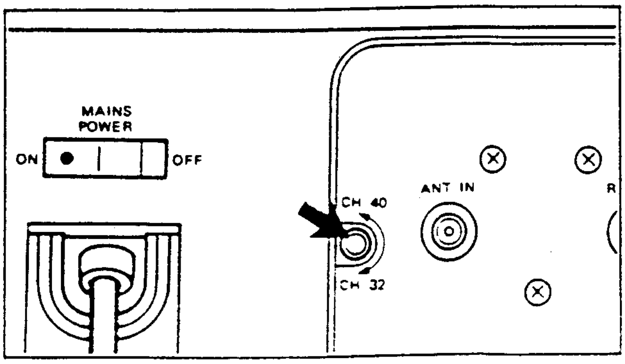
2 Set the video mode switch to CH SET.



4 Reset the video mode switch to COLOUR.

Notes:

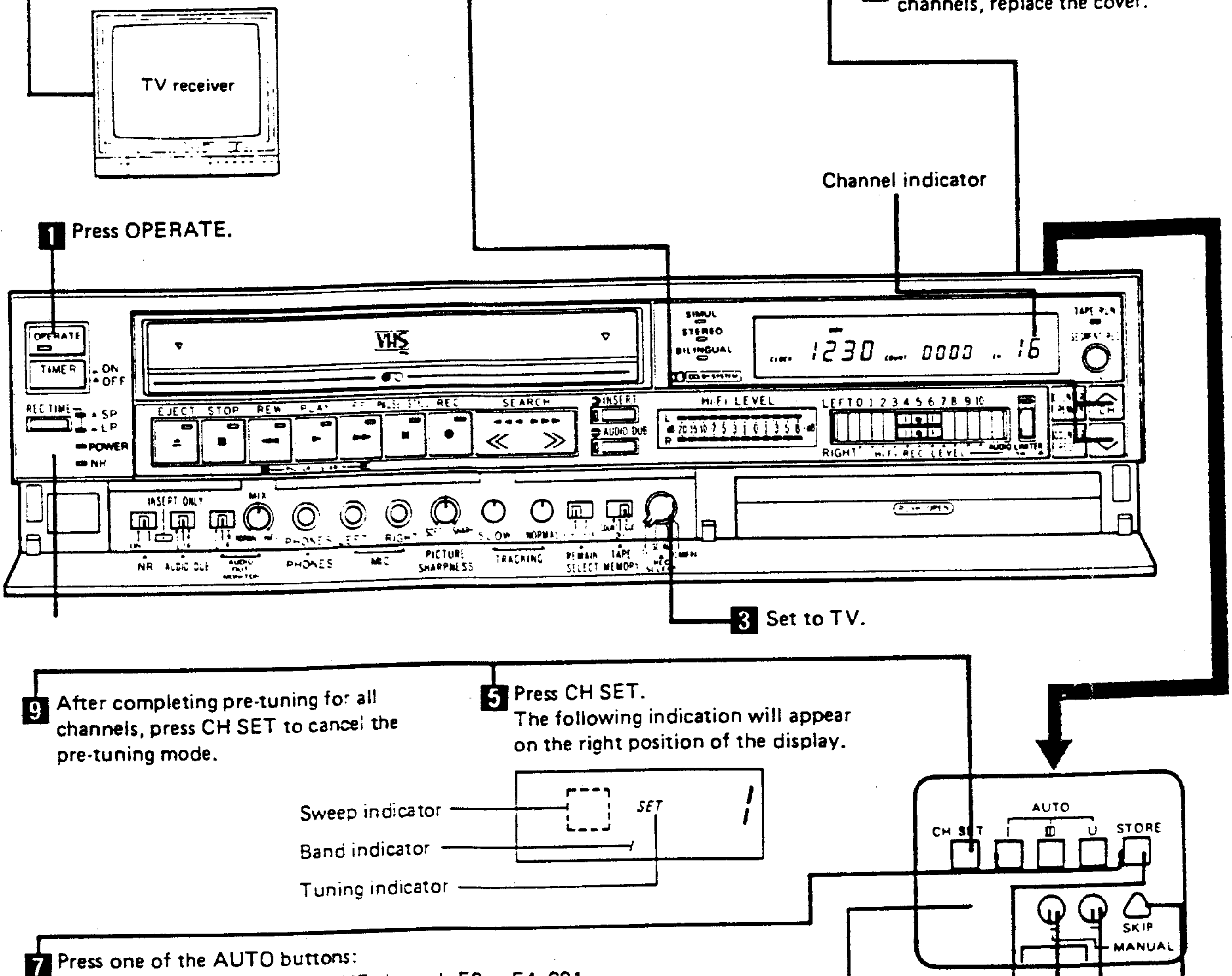
- When you adjust your TV receiver to channel 36 for video playback, if some interference noise is seen on the screen because of broadcasts on neighbouring channels or if your preset broadcasts should be affected in picture quality, it is necessary to shift the RF converter output frequency from that of channel 36.



For this purpose, insert a screwdriver into a hole provided on the rear of the set and re-adjust the RF converter frequency adjustment screw in minute steps. Then tune the TV receiver once again until a clear picture is obtained.
This adjustment requires extreme precision and must be done with the utmost care. We recommend that you consult your NEC dealer for making this adjustment.

- Be sure to set the video mode switch to COLOUR after VIDEO CHANNEL tuning has been completed.
- No signal is available from the AUDIO/VIDEO socket while the test signal is being used.
- If a prerecorded VHS cassette is available, TV adjustment for VIDEO CHANNEL setting is also possible using it to obtain a playback picture. Insert the cassette and operate the N895EG for playing back the cassette. Then tune the TV receiver to obtain clear pictures and sound while monitoring the playback picture on the TV screen.
- If your TV receiver is not provided with an AFC circuit, perform fine tuning of the TV receiver when you are actually viewing video cassettes.

PRE-TUNING THE BUILT-IN TUNER


TV receiver
Channel indicator
OPERATE
TIMER
ON
OFF
SP
LP
POWER
NR
EJECT
STOP
REW
PLAY
REC
SEARCH
INSERT
AUDIO DUB
HI-FI LEVEL
1230
0000
16
Sweep indicator
Band indicator
Tuning indicator
SET
1
AUTO
CH SET
I
III
U
STORE
SKIP
MANUAL
AFC button
(See next page.)
MANUAL tuning buttons
(See next page.)
Channel SKIP button
(See next page.)

1 Press OPERATE.

2 Switch ON.
Adjust the TV receiver's channel to your video channel.

3 Set to TV.

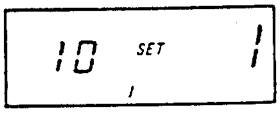
4 Open the pre-tuning compartment cover.

5 Press CH SET.
The following indication will appear on the right position of the display.

6 Specify the channel you wish to preset.

7 Press one of the AUTO buttons:
Press "I" when tuning in to VHF channels E2 – E4, S21 – S23, S1 – S2.
Press "III" when tuning in to VHF channels S3 – S10, E5 – E12, S11 – S20.
Press "U" when tuning in to UHF channels 21 through 69.

- Pressing the AUTO button initiates automatic scanning.
- The SET and "I", "III" or "U" indicators will blink as the auto-scanning process proceeds.
- The last 2 digits of the tape counter functions as a sweep indicator, changing from 0 to 10 to give a rough reference of where tuning in the corresponding band is being performed.



- When any broadcast signal is detected, sweeping will automatically stop and the band indicator will remain lit.

8 Press STORE.

- The SET indicator stops blinking.
- This permits the tuned-in station to be memorised so that you can call up the same station at any time by simply pressing the CHANNEL " ∧ UP" or " V DOWN" button to call up the corresponding channel number on the channel display.

CAUTION

- Proceed to next step after making sure that the SET indicator changes from blinking to lighting.

9 After completing pre-tuning for all channels, press CH SET to cancel the pre-tuning mode.

10 After completing pre-tuning for all channels, replace the cover.

IMPORTANT INFORMATION ON PRE-TUNING

Additional information on the tuning procedure

- If no command is given for about 60 seconds after the CH SET button has been pressed, the channel display will return to the original with the CH indicator illuminated.
- When specifying the channel you wish to preset, the CHANNEL buttons can be pressed either repeatedly for changing the number in a single increment or continuously held for rapid automatic changing.
- When the band indicator (I, III or U) stops blinking in step 7, check to see if the received broadcast is your desired one or not.
- After step 8, change the channel number by pressing the CHANNEL buttons and repeat steps 7 and 8 to preset all necessary channels.
- If the picture is not clear after following all procedures above, perform fine tuning on your television.
- Distorted pictures or sound will be recorded if fine tuning has not been properly performed. Exercise care with this adjustment since the recorded picture and sound cannot be adjusted later.

Manual tuning

- With automatic tuning being performed with the three AUTO buttons, only those stations which have a signal strength exceeding a certain level can be captured.
- To tune in weaker signals, employ manual tuning.
- For manual tuning, first select the band with one of the AUTO buttons and then use either one of the MANUAL buttons. Automatic scanning will stop and scanning will be performed only while one of the MANUAL buttons is being pressed.
- When you capture a desired station, press the STORE button in the same manner as for automatic tuning and the tuned-in station will be memorised.

AFC button

- Leave the button in the ON position.
- When the CH SET button is pressed to engage the Channel Set mode, the AFC circuit is automatically switched off regardless of the setting of the AFC button.
- However, if beats cannot be eliminated during manual tuning, press the AFC button to OFF. After manual tuning, be sure not to leave the AFC button in the OFF position.

Skipping unused channels

Though 32 channels are available for presetting to desired TV channels, you may not need all 32 channels. In such cases, unused channels can be skipped so that only preset channels will be called up by pressing the CHANNEL buttons. For this purpose, proceed as follows:

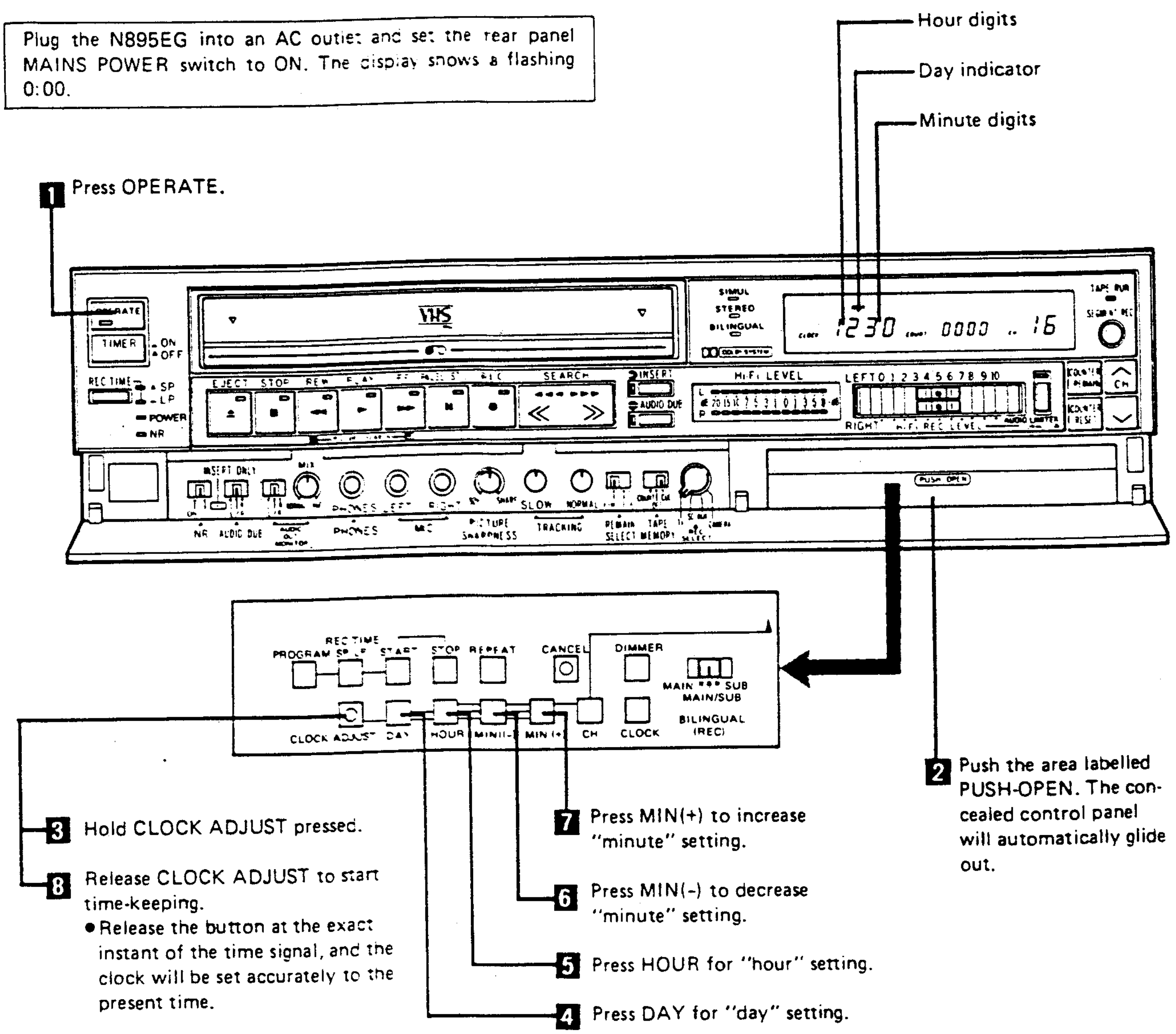
1) Press the CH SET button.
2) Call up the channel number that you wish to skip by pressing either one of the CHANNEL buttons.
3) Press the SKIP button.
    - This completes the procedure for skipping the corresponding channel number.
4) Call up another channel number that you wish to skip and repeat the same procedure above.
5) Press the CH SET button to disengage this mode.

Notes:

- After this mode is disengaged, those skipped channel numbers will not appear on the channel display any more when the CHANNEL buttons are pressed.
- In the Channel Set mode, all channel numbers including skipped ones are successively displayed when the CHANNEL buttons are pressed.
- It is possible to restore the skipped channels for presetting to another TV channel whenever necessary. For this purpose, call up the corresponding channel number in the Channel Set mode and perform pre-tuning. Press the STORE button. Then, the new TV station channel is memorised and called up at any time with the CHANNEL buttons.

CLOCK SETTING

Plug the N895EG into an AC outlet and set the rear panel MAINS POWER switch to ON. The display shows a flashing 0:00.


Hour digits
Day indicator
Minute digits
OPERATE
TIMER
ON
OFF
REC TIME
SP
LP
POWER
NR
EJECT
STOP
REW
PLAY
FF
PAUSE/STILL
REC
SEARCH
INSERT
AUDIO DUB
HI-FI LEVEL
SIMUL
STEREO
BILINGUAL
CLOCK
1230
0000
16
LEFT 0 1 2 3 4 5 6 7 8 9 10
RIGHT
HI-FI REC LEVEL
COUNTER
CH
INSERT ONLY
NR
AUDIO DUB
PHONES
MIC
PICTURE SHARPNESS
SLOW
TRACKING
REMAIN
TAPE SELECT
MEMORY
PUSH OPEN
REC TIME
PROGRAM
SP/LP
START
STOP
REPEAT
CANCEL
DIMMER
MAIN
SUB
MAIN/SUB
CLOCK ADJUST
DAY
HOUR
MIN(-)
MIN(+)
CH
CLOCK
BILINGUAL (REC)

1 Press OPERATE.

2 Push the area labelled PUSH-OPEN. The concealed control panel will automatically glide out.

3 Hold CLOCK ADJUST pressed.

4 Press DAY for "day" setting.

5 Press HOUR for "hour" setting.

6 Press MIN(-) to decrease "minute" setting.

7 Press MIN(+) to increase "minute" setting.

8 Release CLOCK ADJUST to start time-keeping.

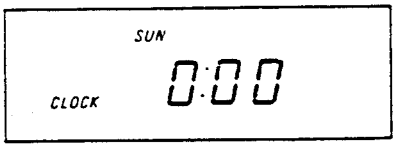
- Release the button at the exact instant of the time signal, and the clock will be set accurately to the present time.

Notes:

- Holding the DAY, HOUR, MIN(+) and MIN(-) buttons pressed continuously advances the corresponding indication automatically. Pressing either of them once advances the indication in single increments only.
- Any sequence of setting the day, hour and minute is possible.

Power failure indicator

The clock display may reset to 0:00 and start to flicker fast. This is not a malfunctioning of the clock, but it indicates that there has been a power failure in excess of one hour. Re-adjusting the time restores the normal condition of the clock display.


SUN
CLOCK
0:00

- If the period of power outage is within about 60 minutes, correct time-keeping continues when power is reapplied.
- During this 60-minute period, the built-in memory back-up capacitor maintains time-keeping and preset timer memory, though the display blacks out.

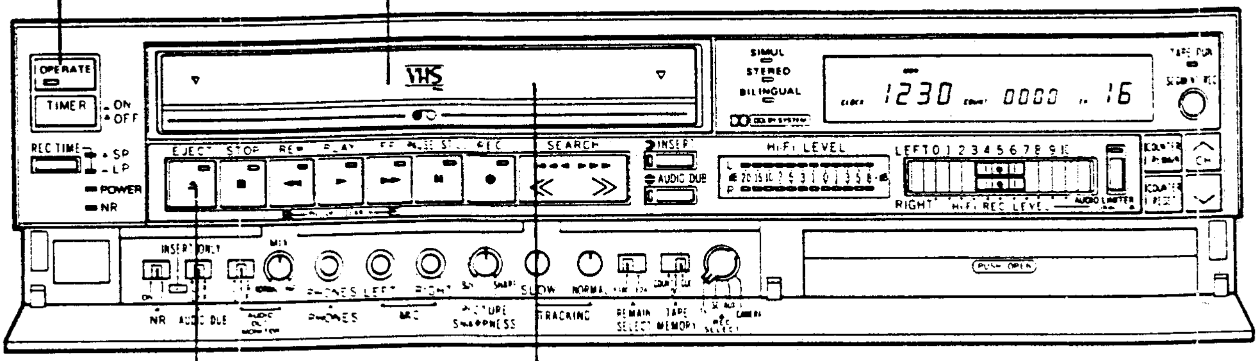
LOADING AND UNLOADING A CASSETTE

Loading

1 Press OPERATE.

2 Insert a cassette with its labelled side facing you.
- With a cassette inserted, the black door flap appears and displays the mark to indicate "cassette inserted".

Note:
It might be that after unpacking your new recorder the black door flap with the "cassette inserted" mark is diaplayed. This is not due to any defect of the unit. Simply insert a cassette. After the first loading/unloading cycle, the door will function properly to show the blue flap when no cassette is inside and the black flap when a cassette is inserted.


OPERATE
TIMER
ON
OFF
REC TIME
SP
LP
POWER
NR
VHS
EJECT
STOP
REW
PLAY
FF
REC
SEARCH
INSERT
AUDIO DUB
SIMUL
STEREO
BILINGUAL
1230
0000
16
HI-FI LEVEL
LEFT 0 1 2 3 4 5 6 7 8 9 10
RIGHT
HI-FI REC LEVEL
AUDIO LIMITER
INSERT ONLY
PHONES
MIC
PICTURE SHARPNESS
SLOW
TRACKING
NR
AUDIO DUB
PUSH OPEN

Unloading

1 Press EJECT.
The cassette will be ejected.

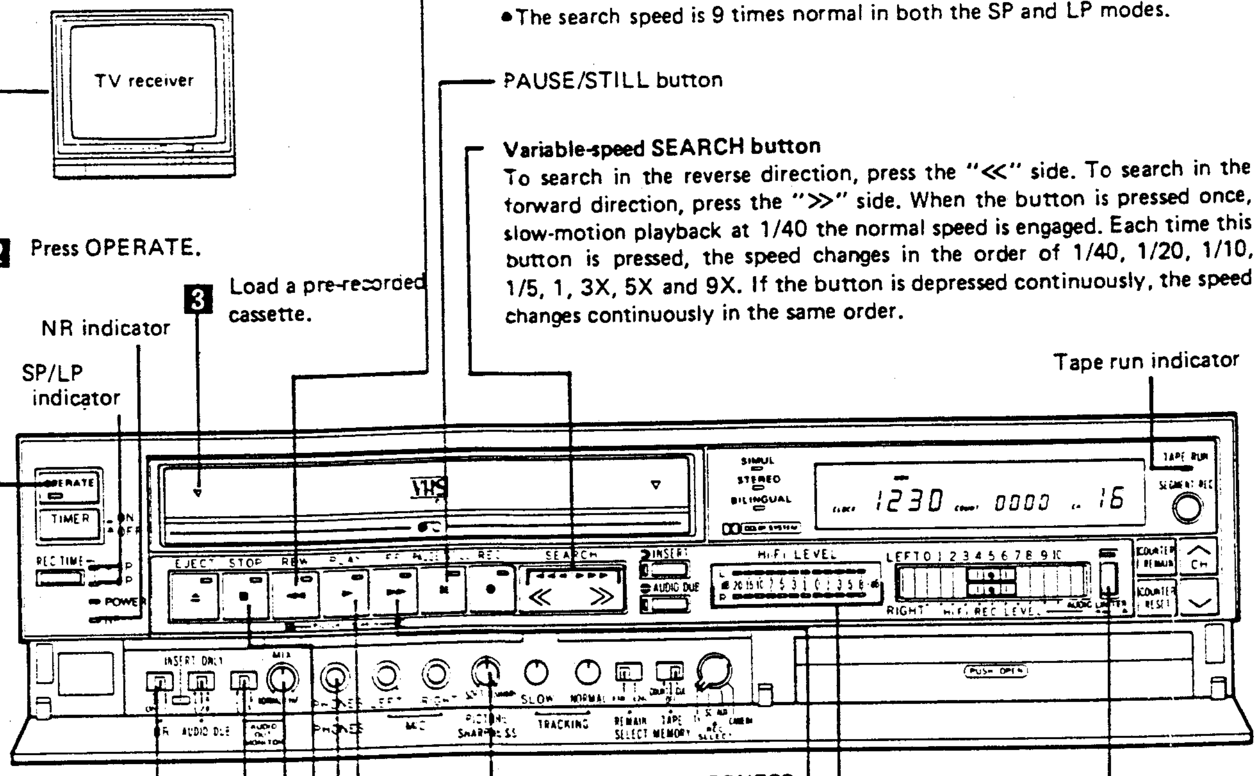
2 Remove the cassette from the loading slot.
- When no cassette is inserted, the blue door flap appears.

Notes:
- Be sure to insert the cassette firmly into the slot; otherwise, it will be automatically ejected.
- The automatic loading mechanism will operate only when the cassette is inserted correctly.
- A cassette inverted cannot be inserted.

Caution
- Since the N895EG employs a motorised cassette loading system, loading and unloading the cassette are only possible when the power is applied to the recorder section. Do not force the cassette into the cassette loading slot while the OPERATE indicator is off.
- Do not attempt to pull out the cassette once automatic loading has started.

PLAYING BACK A VIDEO CASSETTE

1 Switch ON.
Adjust the TV receiver's channel to the video channel.


TV receiver
OPERATE
TIMER
ON
OFF
REC TIME
SP
LP
POWER
VHS
EJECT
STOP
REW
PLAY
FF
PAUSE
REC
SEARCH
INSERT
AUDIO DUB
SIMUL
STEREO
BILINGUAL
1230
0000
16
HI-FI LEVEL
LEFT 0 1 2 3 4 5 6 7 8 9 10
RIGHT
HI-FI REC LEVEL
TAPE RUN
SEGMENT REC
COUNTER REMAIN
CH
COUNTER RESET
INSERT ONLY
MIX
AUDIO DUB
AUDIO OUT MONITOR
PHONES
MIC
PICTURE SHARPNESS
SLOW
TRACKING
REMAIN SELECT
TAPE MEMORY
PUSH OPEN

REW/PICTURE SEARCH button
- To rewind the tape, press this button in the Stop mode.
- To picture search the tape in the reverse direction, hold this button pressed in the Play mode.
- The search speed is 9 times normal in both the SP and LP modes.

PAUSE/STILL button

Variable-speed SEARCH button
To search in the reverse direction, press the "≪" side. To search in the forward direction, press the "≫" side. When the button is pressed once, slow-motion playback at 1/40 the normal speed is engaged. Each time this button is pressed, the speed changes in the order of 1/40, 1/20, 1/10, 1/5, 1, 3X, 5X and 9X. If the button is depressed continuously, the speed changes continuously in the same order.

2 Press OPERATE.

NR indicator

SP/LP indicator

3 Load a pre-recorded cassette.

Tape run indicator

DOLBY NR switch

5 Set the AUDIO OUT MONITOR L/R switch as required.
- To play back stereo recorded tapes, set this switch to L/R.
- To play back tapes having independent soundtracks, select the corresponding channel.
- Monaural tapes can be played back in any position of this switch. However, it is advisable to set this switch to L/R for better sound quality.

PICTURE SHARPNESS control

4 Press PLAY.

Headphone jack

7 Press STOP at the end of the programme.

6 (Not applicable when the audio output from the rear panel Hi-Fi AUDIO OUT connectors is to be listened to.)
Adjust the relative level of hi-fi and normal audio depending on the situation.

AUDIO LIMITER button

Hi-Fi level indicators
LEDs light corresponding to the hi-fi audio signal level if the AUDIO LIMITER button is OFF.

FF/PICTURE SEARCH button
- To fast forward the tape, press this button in the Stop mode.
- To picture search the tape in the forward direction, hold this button pressed in the Play mode.
- The search speed is 9 times normal in both the SP and LP modes.

Notes:
- The REC TIME button may be in either position. The SP or LP mode recording is automatically detected and played back at a correct speed respectively. The LP indicator lights in the LP mode.
- The tape-end auto rewind mechanism functions in both the Play and Fast Forward modes.
- Set the DOLBY NR switch to ON when playing back tapes recorded with Dolby NR. The NR indicator will light. Noise reduction is applied only to the normal audio tracks.
- When the PAUSE/STILL button is pressed during playback, a still picture will appear. The still picture can be advanced in a frame-by-frame manner each time this button is pressed. To cancel the Still mode, press the PLAY button.
- When the Still mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.
- With some televisions, the still picture may be unstable. This is not due to any defect of the unit.
- When listening through headphones, if the volume is too loud, reset the headphone volume select switch located on the bottom of the unit. (See page 13.)
- In the special-effects playback modes, the picture may become unstable from time to time.

CAUTION:
When a tape recorded from SECAM B/G broadcasts in the LP mode is played back, colours disappear if special-effects (still, picture search, variable-speed search, etc.) are applied

TAPE COUNTER/REMAINING TIME COUNTER/COUNTER AND CUE SEARCH/TRACKING CONTROLS

COUNTER/REMAINING button

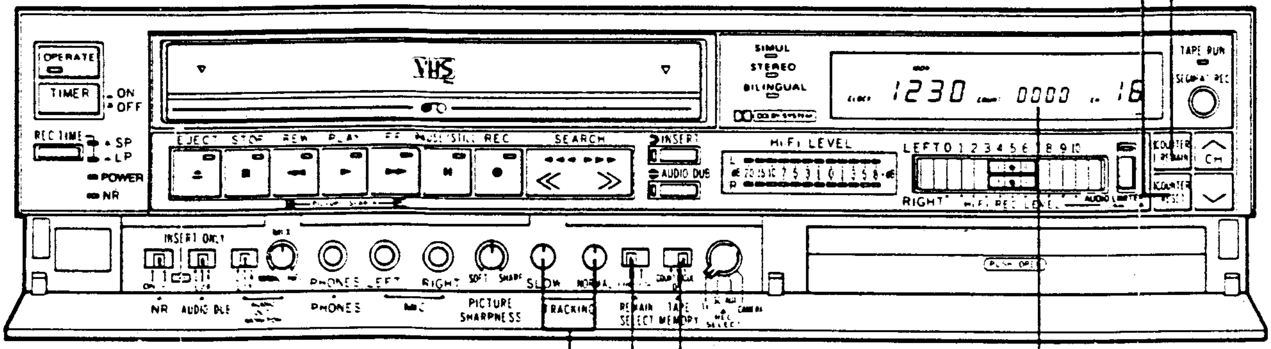
When the OPERATE button is pressed, the tape counter appears on the display with the COUNT indicator illuminated. To check the length of tape left, press the COUNTER/REMAINING button to engage the Remaining Time Counter mode. The REMAIN indicator will light and the reading will show the remaining tape length in hours and minutes. (It will take a brief period for the numerals to appear.) To change the display mode back to the tape counter, press the same button once again.

Notes:

- During recording, the remaining tape length is calculated in reference to the recording mode selected by the REC TIME button; during playback, it is calculated in reference to the recording mode of the tape being played (SP/LP).

COUNTER RESET button

Press to reset the tape counter to "0000" for indexing the tape.



TRACKING controls

If the playback picture contains noise bars (this is likely to happen when you play back a cassette which was recorded with a different video recorder unit), adjust the TRACKING controls. Use the NORMAL TRACKING control in normal-speed playback, and the SLOW TRACKING control in slow-motion playback. Turn them slowly in either direction until the noise bars move out of the picture frame. The NORMAL TRACKING control can also be used to correct hi-fi audio reproduction if noise or breaks are heard in it.

Note

After playing back that particular cassette, be sure to return the TRACKING controls to their centre position.

REMAIN SELECT switch

In order for the remaining time counter to function properly, it is necessary to set this switch correctly.

E240: when using an E-240 cassette.
E180: when using a cassette other than E-240.

TAPE MEMORY switch

A. Counter Memory function
  1. Press the COUNTER/REMAINING button to engage the Counter mode.
  2. Press the COUNTER RESET button at a point which you may wish to locate later.
     - The tape counter will indicate "0000".
  3. Set the TAPE MEMORY switch to COUNT.
  4. Press the REW (or FF) button when you need to return to the designated point. The tape will rewind (or fast forward) and stop at about the "0000" counter reading.

B. Cue Search function

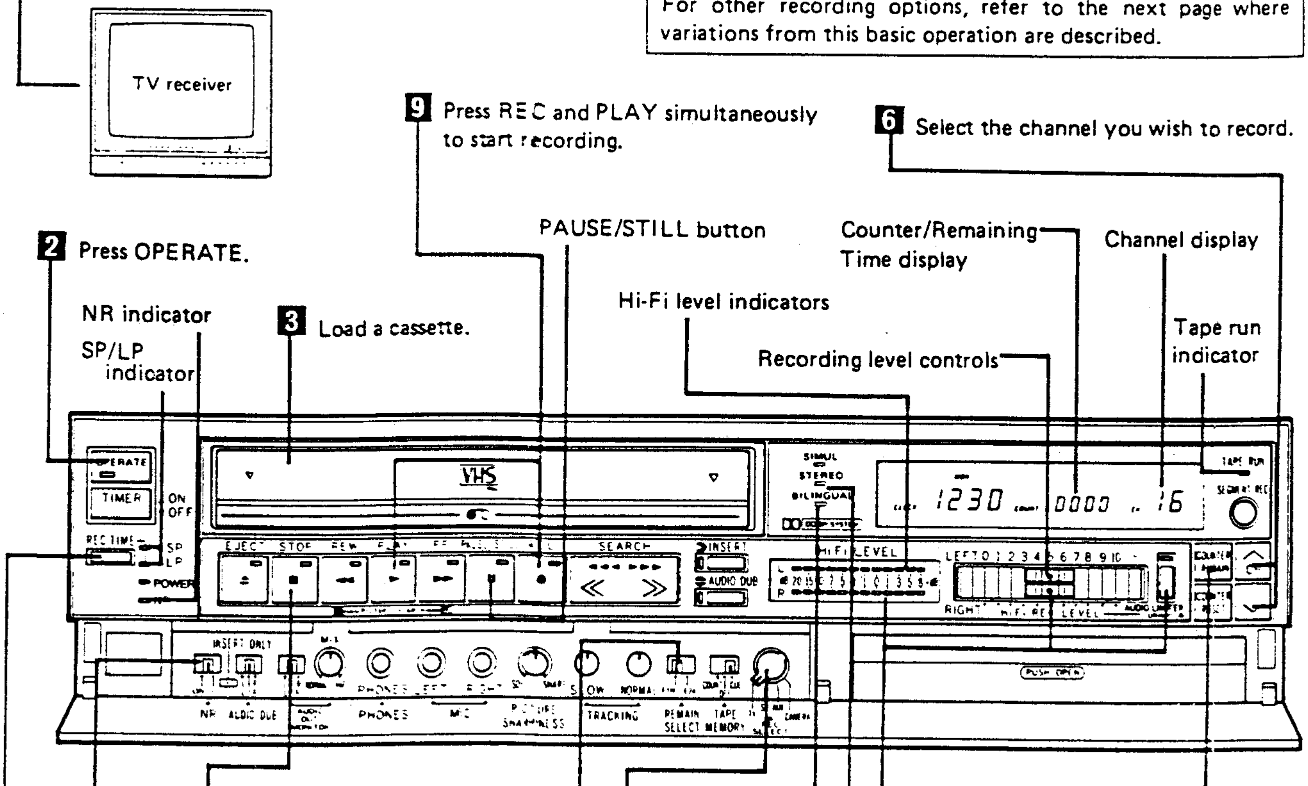
At the beginning of every recording, a cue signal is recorded on the tape. The cue search function enables the sensing of this cue signal and stops the tape at a point where a new recording was made. Similarly to the counter search function, this mode is applicable only in the Fast Forward and Rewind modes. If you wish to view the recorded material immediately after it was made, set the TAPE MEMORY switch to CUE. After recording, if you rewind the tape, it stops automatically where the recording was initiated (the cue signal position).

Notes

- The cue signal is recorded in the following cases:
  (1) When a recording is initiated from the Stop mode (STOP to REC).
  (2) When a timer recording is initiated (TIMER ON to REC). (If several programmes are recorded continuously, no cue signal is recorded between programmes. If there is a time period between the end of one programme and the start of another, a cue signal is recorded when the new programme is started.
  (3) When a recording is initiated from the Play mode by pressing the PLAY button together with the REC button (PLAY to REC).

BASIC OPERATION FOR RECORDING TV PROGRAMMES

This section describes the step-by-step procedure for recording a TV programme while watching it, assuming that it is a regular (monaural audio) programme.
For other recording options, refer to the next page where variations from this basic operation are described.


TV receiver
NR indicator
SP/LP indicator
PAUSE/STILL button
Hi-Fi level indicators
Recording level controls
Counter/Remaining Time display
Channel display
Tape run indicator
COUNTER/REMAINING button
REMAIN SELECT switch
OPERATE
TIMER
ON
OFF
SP
LP
POWER
EJECT
STOP
SEARCH
INSERT
AUDIO DUB
Hi-Fi LEVEL
VHS
1230
0000
16
PHONES
MIC
TRACKING

1 Switch ON.
- Adjust the TV receiver's channel to your video channel.

2 Press OPERATE.

3 Load a cassette.

4 Set to either SP or LP. (REC TIME)
SP (▬): 4 hours with an E-240 cassette.
LP (▬): 8 hours with an E-240 cassette.

5 Set to TV.

6 Select the channel you wish to record.

7 **Hi-Fi audio recording level adjustment**
For automatic level control, press the AUDIO LIMITER button to ON (▬).
For manual level control, leave the button in the OFF position and slide the Hi-Fi REC LEVEL controls referring to the Hi-Fi level indicators. Optimum recording level is obtained when the LEDs light up to 0 or 1 dB with the loudest input signal.

8 Set to ON if you want to apply noise reduction to normal audio.

9 Press REC and PLAY simultaneously to start recording.

10 Press STOP at the end of the programme.

BILINGUAL indicator
Lights when a bilingual programme is being received.

STEREO indicator
Lights when a stereo programme is being received.

Notes:
- If there is part of the programme you don't want to record, press the PAUSE/STILL button. To release the Pause mode, press the PLAY button.
- When recording is restarted from the Pause mode, assemble recording is performed so that the playback picture will not distort at the edit point. A few frames recorded before the pause are erased due to overlap of the new recording. This is not due to any defect of the unit.
- When the Pause mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.
- The built-in tuner's automatic channel lock mechanism prevents the selected channel from being altered during recording. Therefore, if you wish to change the channel during recording, first engage the Pause mode and then select a different channel.
- Sound from microphone(s) connected to the MIC jack(s) can be mixed with the TV sound being recorded.
- If the REC button cannot be engaged, check to see if the cassette safety tab has been removed. (See page 7.)
- When the end of the tape is reached during recording, the tape is automatically rewound to the beginning and stops.
- Press the COUNTER/REMAINING button to check how much recording time is left. (For more details refer to page 26.)

CAUTION:
- Set the REC TIME button to SP (Standard Play) when you wish recordings to be made in the standard mode with better picture and sound quality.
- As suggested on page 1 under WARNING (at the top of the right column), this recorder may be used to record SECAM broadcasts in certain areas. However, if recordings are made in the LP mode, colour pictures are available only in normal playback.

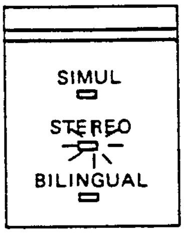
RECORDING ONE TV PROGRAMME WHILE WATCHING ANOTHER

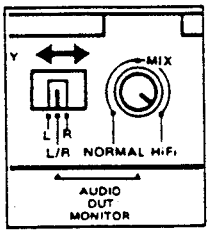
A programme not being viewed can be recorded while you enjoy another programme. This permits the recorded programme to be played back later at your convenience.
The recording procedure is exactly the same as described on the previous page. The points to be remembered are:

- Select the channel you wish to record with the recorder's channel select buttons.
- Select the channel you wish to view with the TV receiver's channel selector.
- The VIDEO/TV button should be in the TV mode (VIDEO indicator off). If the indicator is lit, press the VIDEO/TV button to turn it off.

RECORDING STEREO TV PROGRAMMES

If stereo TV programmes are broadcast in your area, the N895EG automatically receives them in stereo. When a stereo programme is being received, the STEREO indicator lights and recording is made automatically in stereo. To listen to the stereo soundtrack during recording, set the AUDIO OUT MONITOR switch to L/R. If this switch is left either in the L or R position, you will hear only one channel while recording, even though the recording is being made in stereo.





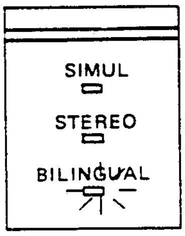
RECORDING BILINGUAL TV PROGRAMMES

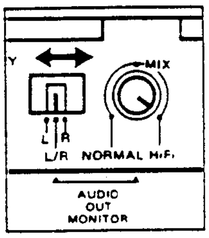
When a bilingual TV programme is being received, the BILINGUAL indicator lights. To record such a programme, pay attention to two additional controls and the basic operation described on the previous page.

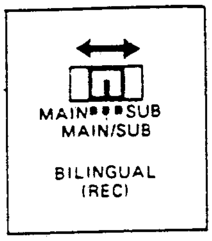
- Set the BILINGUAL (REC) switch, on the glide-out control panel, as required.
  - MAIN: To record only the soundtrack transmitted on the main channel (local language).
  - MAIN/SUB: To record both soundtracks transmitted on the main and sub channels (local and foreign languages).
  - SUB: To record only the soundtrack transmitted on the sub channel (foreign language).
- Set the AUDIO OUT MONITOR switch as required.
  - L: To listen to a local-language soundtrack while recording both soundtracks.
  - R: To listen to a foreign-language soundtrack while recording both soundtracks.
  - L/R: To listen to both soundtracks while recording them.

Note:

- When you are recording only a local-language soundtrack, or a foreign-language soundtrack, you can listen to the sound being recorded regardless of the setting of the AUDIO OUT MONITOR switch.



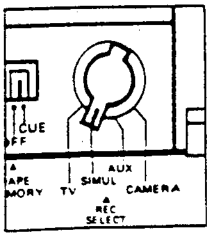




RECORDING FM SIMULCAST TV PROGRAMMES

FM simulcast TV programmes can be recorded (in areas where such programmes are broadcast) using an FM stereo tuner. Connect necessary components as illustrated on page 19. Select the TV channel broadcasting the simulcast programme with the recorder's CHANNEL select buttons and tune the FM stereo tuner to the station broadcasting the soundtrack for this TV programme.
The only difference from the basic recording procedure is in step 5

- Set the REC SELECT switch to SIMUL. Then the SIMUL indicator will light and the TV programme will be recorded with its audio portion recorded on the normal audio track; while the hi-fi audio track will record audio signals from the FM tuner.



RECORDING A TV PROGRAMME WHILE RECORDING AN INDEPENDENT AUDIO SOURCE

Using the 'simulcast' recording function, you can record independent audio and video programmes.
While recording a TV programme, record any audio source independently. For this purpose, set the REC SELECT switch to SIMUL.

Notes:

- If you wish to record only FM broadcasts on video tape, set the REC SELECT switch to AUX and leave the VIDEO IN connector unconnected. The same audio signal will be recorded on both the normal and hi-fi audio tracks.
- After finishing recording, be sure to set the REC SELECT switch to TV.
- When recording both video and audio signals (hi-fi and normal) from the built-in tuner, make certain that the REC SELECT switch is set to TV.

AUTOMATIC TIMER RECORDING

The built-in 14-day/8-event programmable timer permits recording of preset channels on preset days, at preset times for preset lengths while you are away.

17 Press TIMER to ON.
- The TIMER indicator will light together with the numbers of the programmed memories.

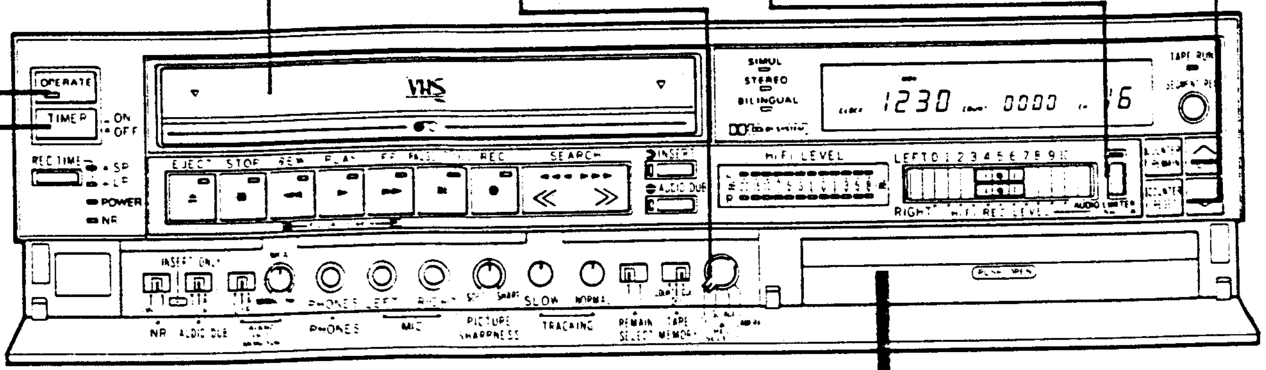
1 Press OPERATE.

2 Load a cassette.

3 Set to TV.

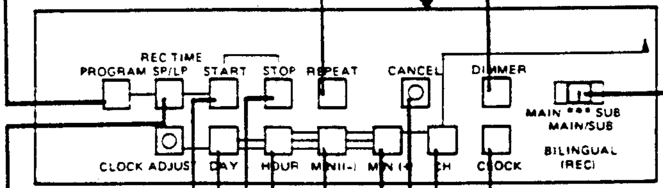
4 Press AUDIO LIMITER to ON.
(For timer recording, it is recommended that the AUDIO LIMITER button be engaged.)

15 Press CHANNEL "∧UP" or "∨DOWN" to obtain desired channel indication.

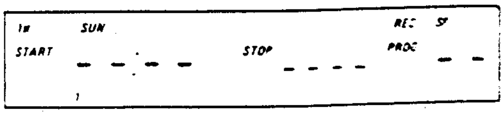

OPERATE
TIMER
ON
OFF
REC TIME
SP
LP
POWER
NR
EJECT
STOP
REW
PLAY
FF
PAUSE
REC
SEARCH
VHS
INSERT
AUDIO DUB
SIMUL
STEREO
BILINGUAL
1230
0000
HI-FI LEVEL
LEFT
RIGHT
AUDIO LIMITER
TAPE RUN
INSERT ONLY
NR
AUDIO DUB
PHONES
MIC
PICTURE SHARPNESS
TRACKING
SLOW
NORMAL
REMAIN
TAPE
SELECT
MEMORY
PUSH OPEN

REPEAT button

DIMMER button


REC TIME
PROGRAM
SP/LP
START
STOP
REPEAT
CANCEL
DIMMER
MAIN
SUB
MAIN/SUB
BILINGUAL (REC)
CLOCK ADJUST
DAY
HOUR
MIN(-)
MIN(+)
CH
CLOCK

5 Press PROGRAM.
- The display will change to the Timer Set mode. You are ready to enter the data into No. 1 programme memory. If you want to change the programme number, press the PROGRAM button a required number of times.


1#
SUN
REC
SP
START
STOP
PROG
1

CAUTION:
Set the BILINGUAL (REC) switch as required, when you have preset to record bilingual programmes. With several programmes preset at a time, it is impossible to select the soundtrack independently for each programme.

9 Press HOUR to obtain desired "hour" indication.

12 Press HOUR to obtain desired "hour" indication.

16 Press CLOCK to change the display to the Clock mode.
- If no command is entered within about 60 seconds, all displays will be restored automatically.

11 Press STOP for switch-off time setting.
- The STOP indicator will flash.

8 Press DAY to obtain desired "day" indication.

14 Press CH for setting the channel from which you want to record.
- The PROG indicator will flash.

7 Press START for day and switch-on time setting.
- The START indicator will flash.

CANCEL button

6 Select the mode of recording.
SP: 4 hours with an E-240.
LP: 8 hours with an E-240.
The REC SP or REC LP indicator will light correspondingly.

10 Press MIN(+) or MIN(-) to obtain desired "minute" indication.

13 Press MIN(+) or MIN(-) to obtain desired "minute" indication.

IMPORTANT INFORMATION ON TIMER RECORDING

Setting the START and STOP times

- It is not possible to set the START and STOP times unless the clock time has previously been set.
- Enter the data while the START or STOP indicator is flashing (about 60 seconds).
- Holding the DAY, HOUR, MIN(+) and MIN(-) buttons pressed for more than 1 second continuously advances the indication automatically. Pressing the buttons once advances the indication in single increments only.
- The sequence of day indications: from "1st SUN" (first Sunday) to "1st SAT" (first Saturday), then "2nd SUN" to "2nd SAT", and then an everyday indication.
- After setting the START time, when the STOP button is pressed, initial STOP time indication will be the same as the start time.
- Unless the START time has been properly set, STOP time setting is not possible.
- The STOP time can be set within 24 hours from the START time. If the hour setting for the STOP time runs into the following day, there is no need to set the day (the DAY button does not function when the STOP time mode is engaged). Recording will stop at the preset time on the following day, even though the day indication is not displayed.

Setting the channel

- Enter the data while the PROG indicator is flashing (about 60 seconds).
- Setting the channel is independent from the START or STOP button. Therefore, it is possible to select the channel either before or after setting the START and STOP times.
- The currently tuned channel locks in the Programme Set mode and, when the display returns to the Clock mode, the locked channel is displayed.

Setting the recording mode

- The recording mode (SP or LP) can be specified for each preset programme using the REC TIME SP LP button on the timer setting section. The setting of the regular REC TIME button on the front panel has no effect on timer recording.

Repeating the programmed data

- When you want to record a daily serial for one week, just obtain the everyday indication when setting the day.
- If you wish to hold the preset data in memory in order for recordings to be made repeatedly according to the same data (for example, at the same time on the same day every week), press the REPEAT button. The REPEAT indicator will light.
- The combination of the everyday indication and REPEAT indication means that recording will be repeated every day indefinitely.

Cancelling the preset data

- The preset programmes can be cancelled by pressing the CANCEL button. For this purpose, first engage the Programme Set mode for the number you wish to cancel and then press the CANCEL button.
- The PROGRAM and CANCEL buttons cannot be pressed simultaneously.

Checking the programmed data

- Checking and re-programming can be performed anytime as long as the OPERATE button is in the ON position (even when the TIMER button has already been engaged in the ON position).
- While recording is actually taking place, the switch-off time can be changed. If the START button is pressed, the switch-on time is displayed, but the START indicator does not flash, indicating that changing of the switch-on time is not possible.
- While recording is actually taking place according to one preset programme, all other preset programmes can be checked or re-programmed.

TIMER indicator

- When the TIMER button is pressed to ON with a cassette loaded and the timer correctly programmed, the TIMER indicator on the display will light with the corresponding preset programme number(s) also lighting and the power is turned off.
- When you have preset several programmes at a time, confirm that all the preset programme numbers light together with the TIMER indicator when the TIMER button is pressed. The programme whose number does not light has not been correctly preset (for instance, the preset switch-on and switch-off times are the same, or no switch-off time has been entered). Recheck the programmed data.
- If all programmes have been wrongly preset, the TIMER indicator will flash for about 10 seconds when the TIMER button is pressed, and then remains lit with no programme number lighting.
- If the TIMER button is pressed when a cassette is not loaded, the TIMER indicator will continue blinking.
- If a cassette with its safety tab removed has been loaded, it will be ejected automatically when the TIMER button is pressed. The TIMER indicator will continue blinking.

Timer operation

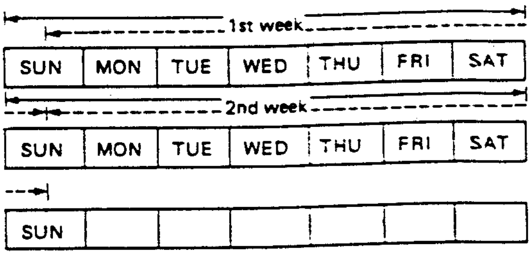
- Tape loading starts 10 seconds before the preset switch-on time and the recording start signal is triggered 2 seconds before the preset time so that recording starts exactly at the preset time.
- During timer recording, the number of the programme that is presently operating will be flashing.
- After timer recording, the power is switched off and the auto rewind mechanism does not function. If the end of the tape is reached during timer recording, the cassette is automatically ejected and then the power is switched off.
- If a power failure should occur (and last longer than about 60 minutes), not only time-keeping stops (see page 20), but also all the preset data will be cancelled. A flashing 0:00 indicates this after power has been reapplied. In such cases, first correct the time indication and then re-enter the programming data.

FOR A BETTER UNDERSTANDING OF THE PROGRAMMABLE TIMER

Two-week timer

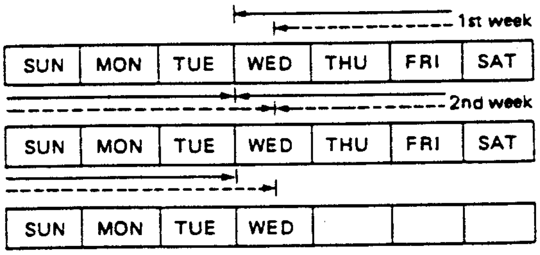
"Two-week" presetting capacity means that you can "reserve" recordings on any one of 14 days in advance including the day of setting.

If the current day of setting is Sunday:



- In this situation, there may be no possibility of confusion in setting the day.
- Namely, the "1st MON" is Monday of the current week and the "2nd MON" is Monday of the next week. The same applies to other week days.
- Regarding Sunday, there are two different cases; one is that you are going to set the timer to a time before the current time of setting and the other is that the preset time is a time after the current time of setting.
- In the former case, the "1st SUN" is the next Sunday and the "2nd SUN" is the Sunday after next.
- In the latter case, the "1st SUN" is the current Sunday and the "2nd SUN" is Sunday of the next week.

If the current day of setting is Wednesday for example:



- Remember that the "1st MON", "1st TUE" and so on . . . mean the first coming Monday, the first coming Tuesday, and so on, and not Monday of the current week.
- Similarly, the "2nd MON", "2nd TUE" and so on . . . are the second coming Monday, the second coming Tuesday, and so on, and not Monday or Tuesday of the next week.
- If you are on Wednesday for example, and wish to record something on Tuesday of the next week, the preset data should be "1st TUE". To record on Thursday of the next week, set "2nd THU".
- Regarding Wednesday, the same as mentioned about Sunday on the left applies.

8-programme timer

"8-programme" presetting capacity means that you can have 8 separate programme entries which contain different programming data. Because of this capacity, you can even "reserve" 8 different TV programmes, either on the same day or on different days.

Each programme (No. 1 through No. 8) entry contains information on "TV channel number", "day", "start time", "stop time", "SP or LP" and "either single or repeat".

Example of the contents of one programme entry:

Programme number	TV channel number	Day	Start time	Stop time	Rec mode	Repeat
2	12	1st WED	10:30	11:30	LP	–

Variety of setting possibilities

- You can set for some day of the 1st week or the 2nd week.
- You can set for one day of every week by first setting that day of the 1st week and pressing the REPEAT button.
- You can set for one day of every week starting from the second week by first setting that day of the 2nd week and pressing the REPEAT button.
- You can set for all days. For this setting, obtain the indication "SUN MON TUE WED THU FRI SAT", and recordings will be repeated at the same time everyday for one week.
- You can set for all days week after week. For this setting, first obtain the indication as mentioned above and then press the REPEAT button. And recordings will be made everyday at the same time week after week.
- All the above applies for all 8 programme entries.

Programme priority

- If you have preset two programmes for the same day and the same start time, the setting corresponding to the smaller programme number has priority.
- If two programmes have preset times which overlap, the earlier-started programme will be interrupted by the latter one.

SEGMENT RECORDING

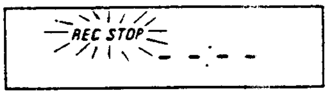
Besides starting and stopping a recording as usual, the N895EG offers a more convenient possibility: starting by the push of a single button, and recording will stop automatically after a certain period of time. Use this facility for starting a recording just before you go to bed or leave home.

1 Press OPERATE.

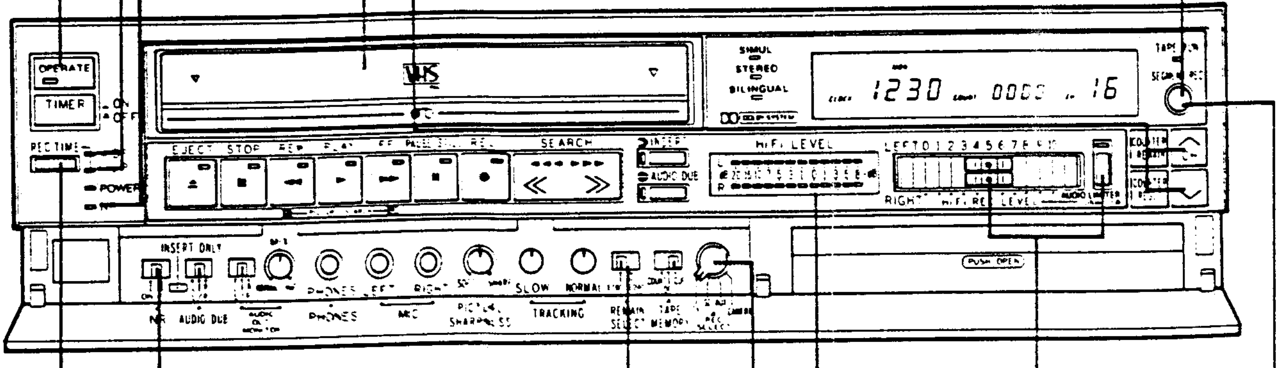
2 Load a cassette.

5 Select the channel from which you want to record.

7 Press SEGMENT REC
- The following indication will appear on the display, to show that the recorder is ready to start recording.
- The REC STOP indicator on the display will flash.



Caution:
Never press the SEGMENT REC button while a cassette is in the process of being loaded.

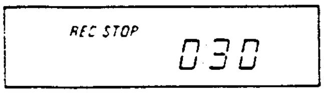


4 Set to either SP or LP. (REC TIME)

3 Set to TV.

6 Set the Hi-Fi audio recording level.

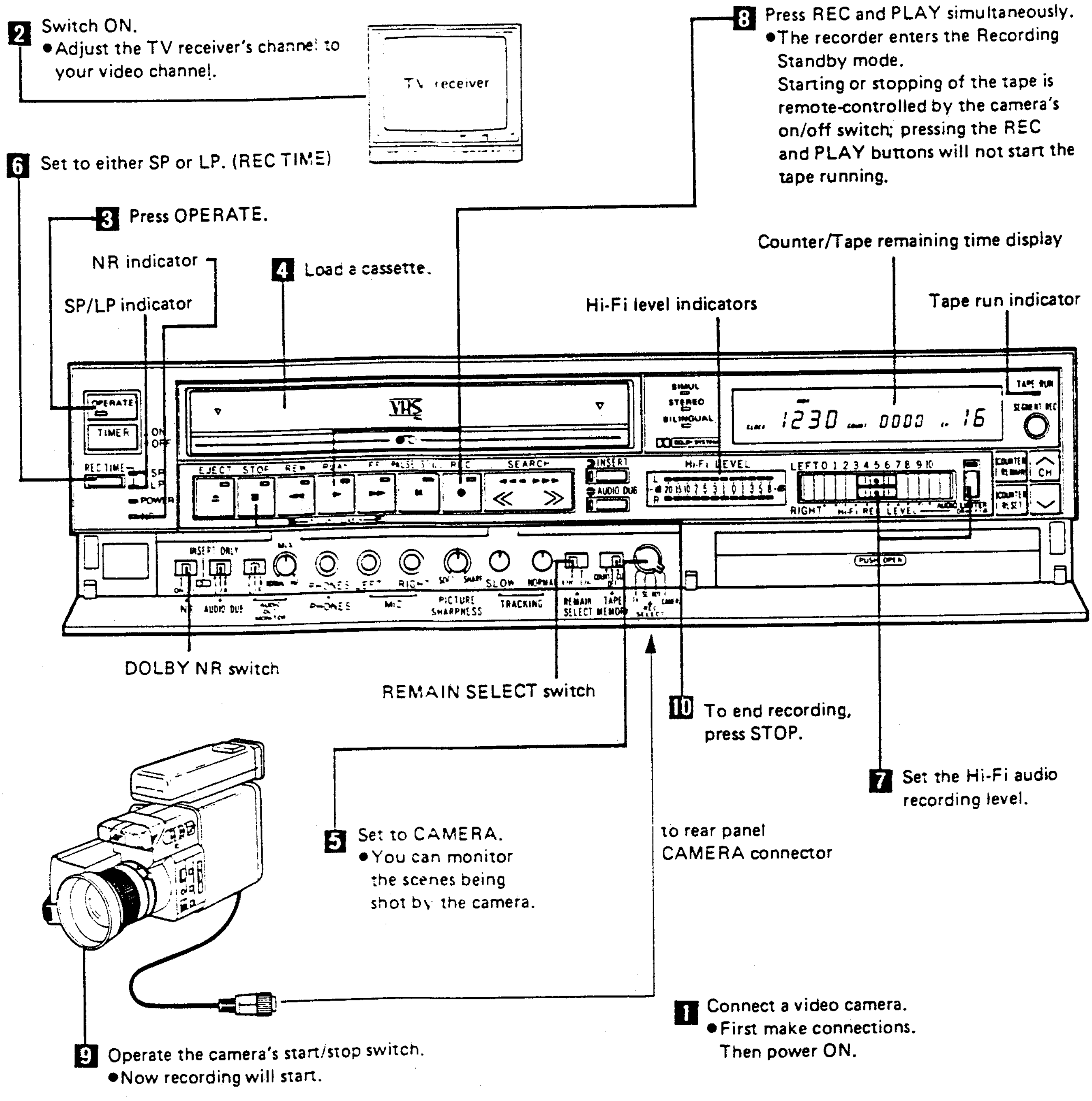
8 Press SEGMENT REC once again.
- Recording will begin immediately and the following indication will appear on the display, showing that recording will automatically stop and power will switch off after 30 minutes.
- The REC STOP indicator remains lit.



9 Each time the SEGMENT REC button is pressed, recording time increases by 30 minutes.
- For a more precise time setting, use the HOUR, MIN(+) and MIN(-) buttons to set to the exact time required.

Notes:
- If the SEGMENT REC button is not pressed a second time within about 10 seconds after it has been pressed once, the Segment Record mode will be cancelled and the display will change back to the Counter mode.
- Timer setting in the Segment Record mode is possible up to a maximum of 4 hours when the SEGMENT REC button only is used. If the MIN (+) button is used after 4:00, this setting can be increased up to 4 hours, 59 minutes.
  If 4:59 is to be obtained, simply press the MIN (-) button once.
- While recording is in progress, the displayed time counts down; when 0:00 is reached, the Record mode is released after 10 seconds. The power will be switched off.
- If you want to stop recording after having started recording in the Segment Record mode, press the STOP button.
- The segment recording function can also be used as a sleep timer. If you press the SEGMENT REC button during normal recording, the REC STOP indicator will light on the display and the indication "0:30" will be obtained, showing that recording will stop automatically after 30 minutes.
  The time span can be adjusted in the same way as for segment recording up to 4 hours, 59 minutes.
- Segment recording has priority over all other modes; you can start recording from any mode using the SEGMENT REC button, even from rewind or fast forward.
- If the SEGMENT REC button is pressed with a non-recordable cassette loaded (one with its safety tab removed), the cassette will be automatically ejected.
- If you want to perform segment recording after you have set the timer and pressed the TIMER button to ON, press the SEGMENT REC button as usual. Power will be turned on and segment recording will start. After segment recording has been performed, the Timer mode is automatically re-entered and power is turned off. The preset time for segment recording has priority over the programmed preset times. Before pressing the SEGMENT REC button, make sure that the segment recording time will not eventually overlap the programmed preset times.
- If the programmed switch-on time for a timer recording should come after the switch-off time of the segment recording, this timer recording will still be made automatically.

RECORDING WITH A VIDEO CAMERA


TV receiver
NR indicator
SP/LP indicator
Hi-Fi level indicators
Counter/Tape remaining time display
Tape run indicator
OPERATE
TIMER
ON
OFF
REC TIME
SP
LP
POWER
VHS
EJECT
STOP
REW
PLAY
FF
PAUSE/STILL
REC
SEARCH
INSERT
AUDIO DUB
SIMUL
STEREO
BILINGUAL
Hi-Fi LEVEL
L
R
1230
0000
16
TAPE RUN
SEGMENT REC
LEFT 0 1 2 3 4 5 6 7 8 9 10
RIGHT
Hi-Fi REC LEVEL
CH
COUNTER RESET
INSERT ONLY
AUDIO DUB
PHONES
LEFT
RIGHT
MIC
SOFT
SHARP
SLOW
NORMAL
PICTURE SHARPNESS
TRACKING
REMAIN SELECT
TAPE MEMORY
CAMERA SELECT
PUSH OPEN
DOLBY NR switch
REMAIN SELECT switch
to rear panel CAMERA connector

2 Switch ON.
- Adjust the TV receiver's channel to your video channel.

6 Set to either SP or LP. (REC TIME)

3 Press OPERATE.

4 Load a cassette.

8 Press REC and PLAY simultaneously.
- The recorder enters the Recording Standby mode. Starting or stopping of the tape is remote-controlled by the camera's on/off switch; pressing the REC and PLAY buttons will not start the tape running.

10 To end recording, press STOP.

7 Set the Hi-Fi audio recording level.

5 Set to CAMERA.
- You can monitor the scenes being shot by the camera.

1 Connect a video camera.
- First make connections. Then power ON.

9 Operate the camera's start/stop switch.
- Now recording will start.

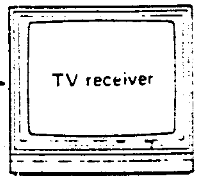
Notes
- For various sound recording possibilities while recording with a camera, refer to the chart on page 16.
- If microphone(s) are connected to the N895EG's MIC jacks, this microphone input is recorded mixed with the camera's built-in microphone.
- If feedback noise (whistling or howling) is heard from the TV receiver, reduce the volume or move the microphone, either external or built within the camera, farther away from the TV receiver.
- Power to the camera is switched on or off with the power switch or by using the built-in timer.
- With some cameras, their battery warning indicator may flicker, however, no problem occurs with recording as long as the picture being monitored on the TV screen appears normal.
- For camera operation refer to the instruction manual for the relevant camera.

AUDIO DUBBING

Audio dubbing means recording a new soundtrack on a pre-recorded tape. In other words, the previously recorded sound is erased and replaced with a new soundtrack. **Audio dubbing is applicable only to the longitudinal audio tracks (normal audio).** Therefore, a dubbed narration can be heard together with the original hi-fi sound.

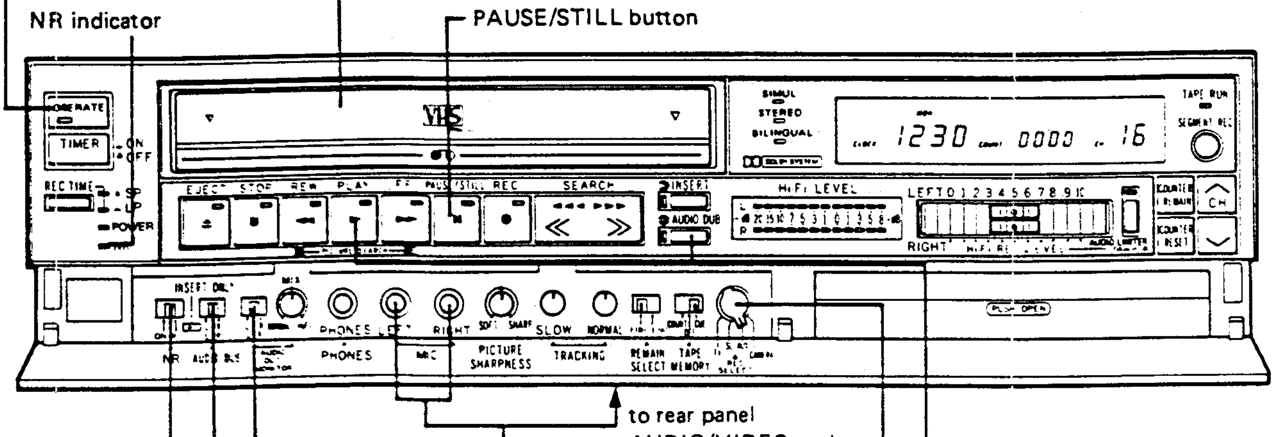
Possible channels: Left channel only or right channel only or even both channels simultaneously for stereo audio dubbing.

1 Switch ON.
- Adjust the TV receiver's channel to your video channel.


TV receiver

2 Press OPERATE.

3 Load a pre-recorded cassette.


NR indicator
PAUSE/STILL button
to rear panel AUDIO/VIDEO socket
OPERATE
TIMER
ON
OFF
REC TIME
SP
LP
POWER
VHS
EJECT
STOP
REW
PLAY
FF
PAUSE/STILL
REC
SEARCH
INSERT
AUDIO DUB
SIMUL
STEREO
BILINGUAL
1230
0000
16
Hi-Fi LEVEL
LEFT 0 1 2 3 4 5 6 7 8 9 10
RIGHT
TAPE RUN
SEGMENT REC
COUNTER
CH
INSERT ONLY
MIC
PHONES
LEFT
RIGHT
SOFT
SHARP
SLOW
NORMAL
NR
AUDIO DUB
PHONES
MIC
PICTURE SHARPNESS
TRACKING
REMAIN
TAPE
SELECT
MEMORY
PUSH OPEN

4 Set to ON if you want to apply noise reduction to normal audio.

5 Connect microphones or audio sources to the MIC jacks or the AUDIO/VIDEO socket respectively.

6 Set to AUX.
- If you record sound only from the microphone(s), the source equipment connected to the AUDIO/VIDEO socket should be OFF.

7 Set AUDIO DUB as required.

L:	to replace the left-channel sound only while retaining the right-channel sound.
L/R:	to replace sound on both channels with a stereo recording.
R:	to replace the right-channel sound only while retaining the left-channel sound.

8 Press AUDIO DUB and PLAY simultaneously.
- The AUDIO DUB and PLAY indicators will light and audio dubbing will start.

9 Set AUDIO OUT MONITOR switch as required.
- Monitor only the sound being dubbed or that sound together with the original sound that is to be retained.
- The selected channel can be heard via headphones as well.
- It is advisable to set the AUDIO OUT MONITOR (audio mixing volume) control to NORMAL.

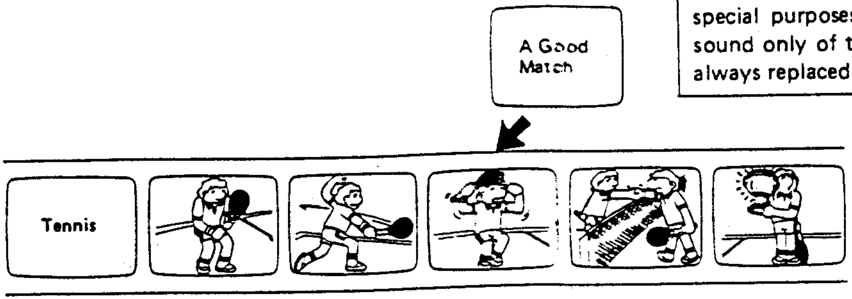
Notes
- Use a high-impedance microphone.
- If whistling or howling is heard during audio dubbing, reduce the TV volume or move the microphone(s) farther away from the TV. Recording is being performed even if sound is not heard from the TV receiver. If you want to monitor the sound being recorded, connect headphones to the PHONES jack.
- The pause function facilitates audio dubbing. First play back the pre-recorded tape and press the PAUSE/STILL button at the point from which you wish to start audio dubbing. If necessary, adjust the point accurately by pressing the PAUSE/STILL button a few more times. Then press the AUDIO DUB and PLAY buttons simultaneously. This permits you to start audio dubbing exactly at the right point.

CAUTION:
Audio dubbing is not possible with an audio source connected to the rear panel AUDIO LINE IN connectors.

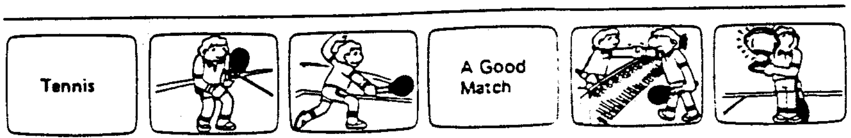
INSERT EDITING

Insert editing means recording a new scene into a section of pre-recorded tape so that a part of the original recording can be replaced with a new sequence without excessive picture distortion at edit-in and edit-out points. New video and audio signals to be inserted can come either from a video camera or another video cassette recorder, or even from the built-in tuner.

CAUTION
Since video and audio signals are recorded simultaneously, **both hi-fi and normal audio soundtracks are replaced with new recordings simultaneously.** However, if the AUDIO DUB switch is set to L (OFF), the normal audio soundtrack will not be replaced. If you wish to preserve the original soundtrack, set this switch to L (OFF – INSERT ONLY). Normally set this switch to L/R and, for special purposes, set it to R to replace the right-channel sound only of the normal audio soundtrack. Hi-fi audio is always replaced together with video by insert editing.


A Good Match
Tennis

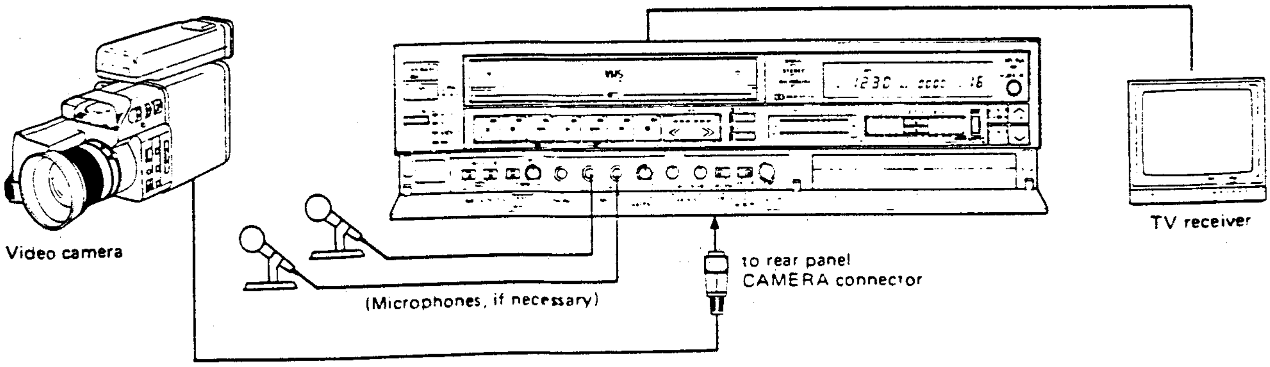
Original tape


Tennis
A Good Match

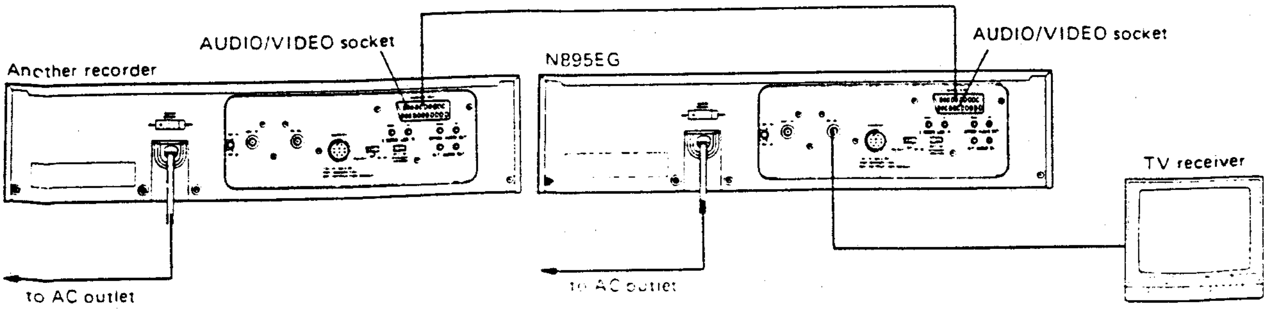
Edited tape

Connections

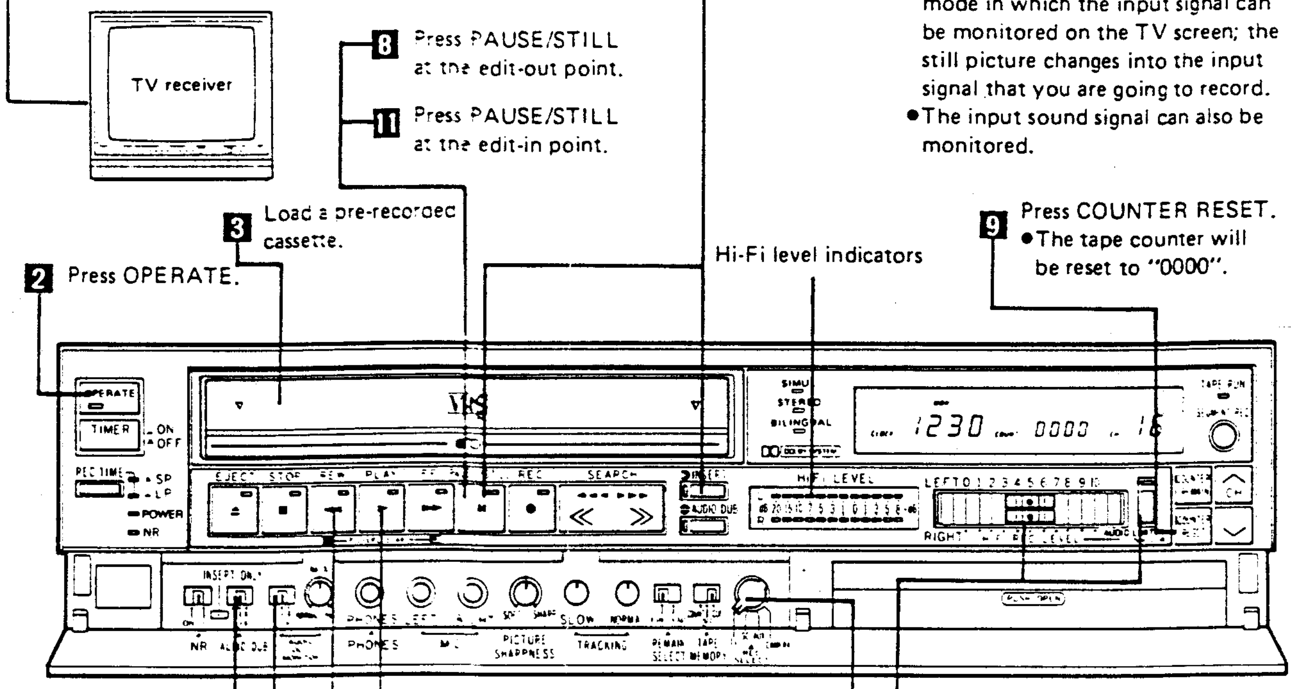
For inserting video and audio signals from a camera connected to the rear panel CAMERA connector.


Video camera
(Microphones, if necessary)
to rear panel CAMERA connector
TV receiver

For inserting video and audio signals from another video cassette recorder.


AUDIO/VIDEO socket
Another recorder
N895EG
AUDIO/VIDEO socket
TV receiver
to AC outlet
to AC outlet

Procedure


TV receiver
OPERATE
TIMER
ON
OFF
REC TIME
SP
LP
POWER
NR
VHS
EJECT
STOP
REW
PLAY
FF
REC
SEARCH
INSERT
AUDIO DUB
SIMUL
STEREO
BILINGUAL
1230
0000
HI-FI LEVEL
LEFT
RIGHT
INSERT ONLY
NR
AUDIO DUB
PHONES
MIC
PICTURE SHARPNESS
SOFT
SHARP
SLOW
TRACKING
NORMAL
REMAIN
TAPE SELECT MEMORY
PUSH OPEN

1 Switch ON.
- Adjust the TV receiver's channel to your video channel.

2 Press OPERATE.

3 Load a pre-recorded cassette.

4 Set REC SELECT as required.

AUX:	To insert programmes from a different tape.
CAMERA:	To insert camera signals from a camera connected to the CAMERA connector.
TV:	To insert TV programmes from the built-in tuner.
SIMUL:	To insert FM simulcast programmes.

5 Set the Hi-Fi audio recording level.

AUDIO OUT MONITOR switch.

6 Set AUDIO DUB as required. (See CAUTION on previous page.)

7 Play back the tape to determine the edit-out point (the end of the tape section to be replaced).

8 Press PAUSE/STILL at the edit-out point.

9 Press COUNTER RESET.
- The tape counter will be reset to "0000".

10 Press REW/PICTURE SEARCH to determine the edit-in point (the beginning of the tape section to be replaced).

11 Press PAUSE/STILL at the edit-in point.

12 Press INSERT and PAUSE/STILL simultaneously.
- This engages the Insert Standby mode in which the input signal can be monitored on the TV screen; the still picture changes into the input signal that you are going to record.
- The input sound signal can also be monitored.

Hi-Fi level indicators

13 Operate the source equipment properly.
- Play back on another recorder the tape programme to be inserted.
- Operate the camera so that it is in the locked running mode.
- Select the channel to be recorded.
- Select the channel and set the FM tuner.

14 Press PLAY to start insert editing.
- Now video and audio signals will be recorded simultaneously.
- At the counter reading of "0000", recording will stop automatically.
- The tape will continue running in the Play mode.

Notes

- Do not use the STOP button to stop insert editing. If you press the STOP button, the tape stops and the Insert Edit mode is cancelled.
- If you wish to stop insert editing before the specified edit-out point is reached, press the COUNTER RESET button. Then the Play mode will be entered.
- The insert editing mechanism used in the N895EG has been developed for home use applications. It may happen that pictures slightly distort or colours are incorrect at the edit points. This is not due to any defect of the unit.
- The recording mode is automatically determined by the previous recording on which the new segment is inserted regardless of the setting of the REC TIME button.
- If the edit start point of the new scene lies in the SP mode and the edit end point of the same scene lies in the LP mode or vice versa, the inserted picture will distort at the switching point in the recording mode.

IN CASE OF DIFFICULITY

What may initially appear to be trouble is not always a real problem. Make sure first . . . .

POWER AND TAPE TRANSPORT PROBLEMS

Symptoms	Check points
No power is applied to the recorder.	● Is the power cord disconnected? – Connect it. ● Is the rear panel MAINS POWER switch set to OFF? – Set to ON.
Clock is functioning properly, but the recorder cannot be powered.	● Is the TIMER button pressed to ON? – Press it to OFF.
Tape does not run during recording.	● Is the PAUSE/STILL button engaged? – Press the PLAY button.
Tape stops in the Rewind or Fast Forward mode.	● Is the TAPE MEMORY switch set to either COUNT or CUE? – Set it to OFF.
Tape will not rewind or fast forward.	● Is the tape already fully rewound or fast forwarded? – Check the cassette.

RECORDING PROBLEMS

Symptoms	Check points
Recording cannot be started.	● Is a cassette loaded? ● Is the safety tab on the cassette removed? – Reseal the slot with cellophane tape.
TV broadcasts cannot be recorded.	● Is the REC SELECT switch set to AUX or CAMERA? – Set it to TV.
Camera recording is not possible.	● Is the camera correctly connected to the CAMERA connector? ● Is the REC SELECT switch set to a position other than CAMERA? – Set it to CAMERA.
Simulcast recording is not possible.	● Is the REC SELECT switch set to a position other than SIMUL? – Set it to SIMUL. ● Is an audio source correctly connected to the AUDIO LINE IN connectors? – Check connections.
Timer recording is not possible.	● Have you set the clock correctly and programmed the timer correctly? – Check once again. ● Is the TIMER button pressed to OFF? – Press it to ON.
Audio dubbing is not possible.	● Is the safety tab on the cassette removed? – Reseal the slot with cellophane tape.

PLAYBACK PROBLEMS

Symptoms	Check points
Playback picture does not appear while the tape is running.	● Is the TV receiver's channel selector set to the correct video channel? – Set it to channel 0 or 1.
Noise appears on the search and still pictures.	● This is normal.
Noise appears during normal playback.	● Adjust the NORMAL TRACKING control.
Noise appears during slow-motion playback.	● Adjust the SLOW TRACKING control (in some cases, accurate adjustment cannot be obtained).
Playback picture is blurred or interrupted while TV broadcasts are clear.	● Video heads may be dirty. – Head cleaning is necessary. Consult your nearest NEC dealer.
Playback sound is different from that intended to be recorded.	● Is a microphone plugged in? – Unplug it.
Normal audio soundtrack is not available from the connected audio equipment.	● Is the audio equipment connected to the Hi-Fi AUDIO OUT connectors? – Connect it to the MIXED AUDIO OUT connectors.

HI-FI AUDIO PROBLEMS

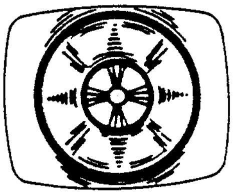
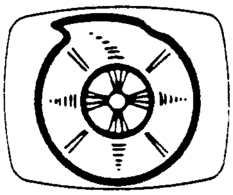
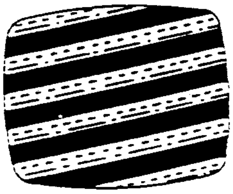
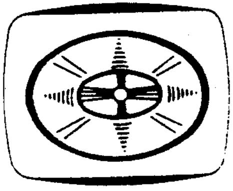
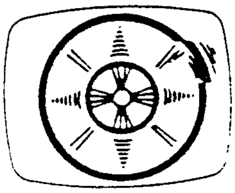
Symptoms	Check points
TV sound cannot be recorded on hi-fi audio tracks.	● Is the REC SELECT switch set to SIMUL? – Set it to TV.
Breaks are noticeable in hi-fi audio reproduction.	● Adjust with the NORMAL TRACKING control.
Soundtrack on hi-fi audio tracks cannot be reproduced.	● Is the AUDIO OUT MONITOR control fully turned to NORMAL? – Turn it toward Hi-Fi until the desired hi-fi audio level is obtained.
Hi-Fi level indicators do not function.	● Is the AUDIO LIMITER button pressed to ON? – Press it to OFF.

OTHERS

Symptoms	Check points
Whistling or howling is heard from TV.	● Move camera or microphone away from TV or reduce TV sound volume.
Clock setting is not possible.	● Press the OPERATE button to ON. (The TIMER button should be OFF.)
Some channels are skipped over when selecting a channel.	● Those channels are preset to be skipped over. If you need them, restore them.
Channel cannot be switched.	● Is recording in progress? – During recording, you cannot change the channel.
No control button functions.	● Set the MAINS POWER switch to OFF once and set to ON again.

ADJUST YOUR TV RECEIVER WHEN . . .

Still, slow and fast-motion playback may require adjusting your TV receiver. If your TV shows the following symptoms during playback in these modes, adjust the TV receiver first.

Symptom	Adjustment
Picture vibrates vertically. 	Turn the V-Hold knob slightly for stabilizing.
The upper portion of the picture drifts horizontally. 	Turn the H-Hold knob slightly for stabilizing.*
Picture rolls. 	Turn the H-Hold knob slightly for stabilizing.
Picture is flattened vertically. 	Inherent in your TV receiver.
Only a portion of the picture continues to flicker. 	Not adjustable. Inherent in your TV receiver.

If the V-Hold and H-Hold knobs are not provided on your TV receiver, please consult your NEC dealer.

HEAD CLEANING

- Picture playback may become blurred or interrupted while the TV programme received is clear. This does not mean that the recorded programme has been erased.
- Dirt accumulated on the head after long periods of use causes such troubles. In this case, head cleaning requiring highly technical care is necessary.

*For head cleaning, consult the nearest NEC dealer.

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*If an unsatisfactory result is obtained, it is necessary to adjust the AFC circuit of the TV receiver.

SECTION 1
GENERAL DESCRIPTION

1.1 INTRODUCTION

Development of consumer type video tape recorders initially concentrated on bringing the cost of such equipment to within the range accessible to ordinary consumers, while at the same time maintaining sufficient picture quality to render the systems desirable to the average person. Of these efforts, the VHS format has proven to be the most successful, both in technical respects and in terms of consumer popularity.

However, many owners and prospective owners of video cassette recorders also possess respectable quality audio high fidelity systems. Consequently, the demand has been growing for enhancing the sound quality of video cassette recorders to a level equivalent to stereo audio components.

One of the earliest proposed methods for accomplishing this has also proven to be the most effective, i.e.: include "flying" audio heads along with the video heads on the rotating head drum. In principle, this takes advantage of the high relative speed between heads and tape, thereby extending the audio frequency response to the range that can justly be called "high fidelity".

The adopted method, however, was not without its technical challenges. Foremost among these are 1) inserting extended range audio information along with the already extremely dense video information, 2) avoiding mutual interference between the audio and video signals, and 3) maintaining compatibility with the existing VHS format.

The VHS Hi-Fi System has been developed by taking these main factors into consideration. As a result, a series of high performance audio-visual (A/V) products is being produced for reaching an important, but very demanding, section of the market.

1.2 DEPTH MULTIPLEX (D-MPX) RECORDING

This method allows the recording of two different (audio and video) signals on the same magnetic tape track. On the rotating head drum, the audio heads are mounted at positions prior to the video heads. These record the audio information on the magnetic tape at nearly saturation level. Afterwards, the video heads record the picture information over the audio data, partially erasing the audio signal (but leaving ample remaining level to allow normal playback).

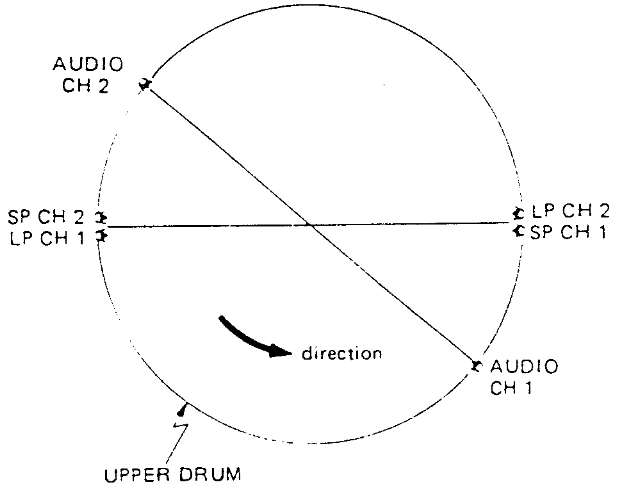


Fig. 1-2-1 VHS Hi-Fi heads

Since the audio signal is frequency modulated (FM) prior to recording, the resulting reduction in level (approximately 12 dB) does not significantly affect playback sound quality.

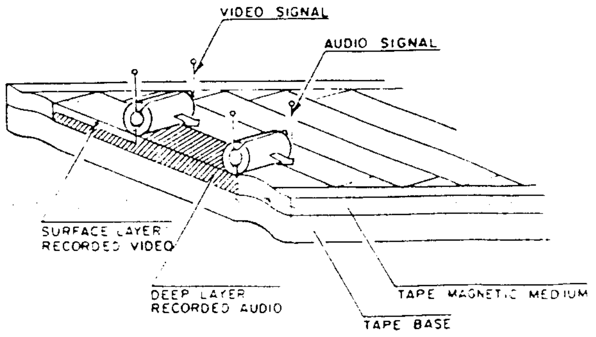


Fig. 1-2-2 Depth multiplex recording

1.3 AZIMUTH DIFFERENCE

Due to the physical principles affecting magnetic heads and tape, normal playback level is achieved when the azimuth angles of the recording and playback heads precisely coincide. As the difference between these angles increases, the playback level drops sharply.

This property forms the basis of the azimuth recording system. The azimuth angle difference between video channels is ±6°, while that between the audio channels is ±30°. Consequently, each audio and video head yields an effective output only when it traces the signal corresponding to its own particular azimuth angle.

1.4 FREQUENCY SPECTRUM

As can be noted from Fig. 1-4-1(A), the VHS format signal spectrum is formed by separating the luminance (Y) and chrominance ("chroma" or C) components of the color video signal, then converting the chroma signal to a lower frequency range (i.e., down converted chrominance). This process leaves a relatively open spectral slot between 1 MHz and 2 MHz.

The audio channel signals are frequency modulated at carrier frequencies of 1.4 MHz and 1.8 MHz, resulting in the VHS Hi-Fi frequency spectrum illustrated in Fig. 1-4-1(B).

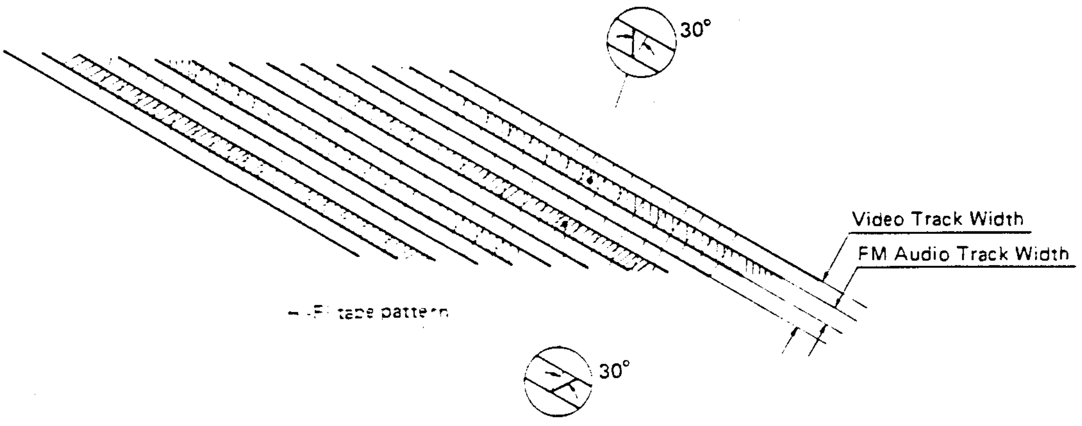


Fig. 1-3-1 VHS Hi-Fi magnetic tape pattern

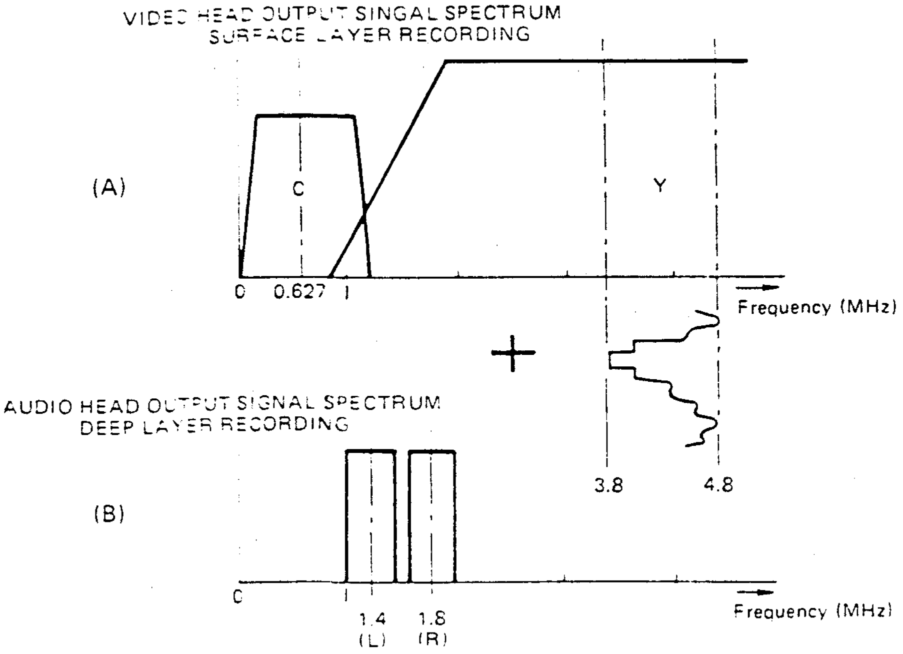


Fig. 1-4-1 Frequency spectrum

1.5 MAINTAINING VHS FORMAT COMPATIBILITY

This is achieved by retaining the fixed audio head used in previously marketed VHS equipment. As a result, there are actually three audio tracks: two "flying" and one longitudinal.

Therefore, video programs recorded by the VHS Hi-Fi machines can be played back on conventional VHS format machines, and vice versa (of course, in both cases, the extended audio performance is not reproduced).

1.6 BLOCK DIAGRAM OUTLINE

As the block diagram of Fig. 1-6-2 indicates, considerable engineering effort has been devoted to maximizing signal to noise ratio (S/N). For reducing tape hiss noise and improving dynamic range, a newly developed peak detector type noise reduction circuit is employed. In this compression-expansion ("compander") system, the dynamic range of the input audio signal is compressed prior to recording. Upon playback, the signal is expanded to return to its original dynamic range.

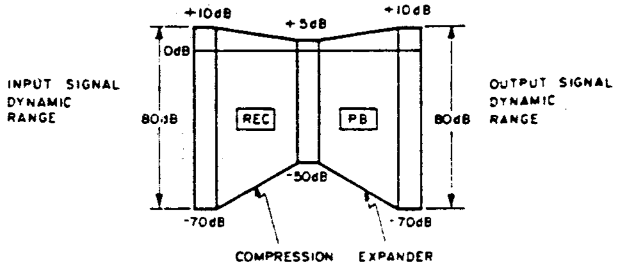

+10dB
+5dB
+10dB
0dB
INPUT SIGNAL DYNAMIC RANGE
80dB
REC
PB
80dB
OUTPUT SIGNAL DYNAMIC RANGE
-50dB
-70dB
-70dB
COMPRESSION
EXPANDER

Fig. 1-6-1 Noise reduction

Since the audio signal is frequency modulated, modulation noise becomes introduced. A pre-emphasis circuit therefore enhances the high frequencies prior to modulation, while a limiter serves to avoid overmodulation. Following modulation, a lowpass filter (LPF) functions to attenuate high frequency noise.

During playback, the FM signals from the audio heads are joined into continuous signals by reference to the drum flipflop pulse. Bandpass filters (BPF) separate the left and right channel FM carriers, which are applied to their respective demodulators and dropout compensators.

Each signal then goes through a lowpass filter to a de-emphasis circuit, which reverses the enhancement applied during recording. Finally, the expander portion of the noise reduction system reverses the compression used in recording to yield the playback output.

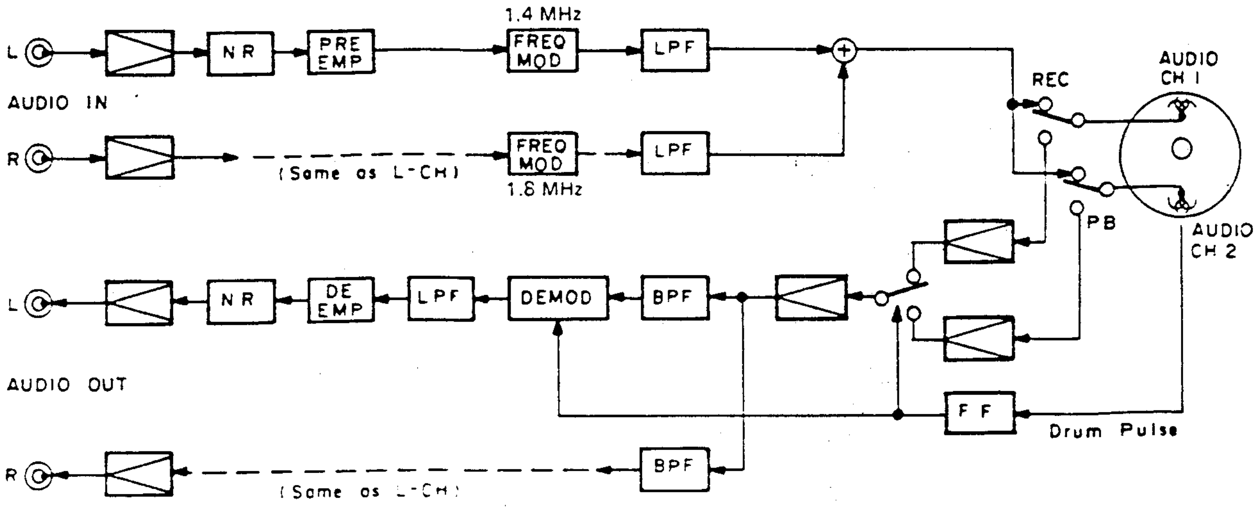

L
AUDIO IN
R
NR
PRE EMP
1.4 MHz
FREQ MOD
LPF
(Same as L-CH)
FREQ MOD
1.8 MHz
LPF
REC
AUDIO CH 1
PB
AUDIO CH 2
L
NR
DE EMP
LPF
DEMOD
BPF
AUDIO OUT
F F
Drum Pulse
R
(Same as L-CH)
BPF

Fig. 1-6-2 FM audio block diagram

1.7 MECHANISM CONTROL OPERATIONS

1.7.1 Mechacon operations

1. Power ON

The rear panel MAINS POWER switch is set to ON.

The power ON state allows a cassette to be inserted and removed. In this state, the front panel LED lights and all machine operations are enabled. This state is attained when:

1) Front panel OPERATE button is set to ON. If it is already ON, briefly set it to OFF, then return to ON. The power ON state can also be set from the remote control unit. At this time, the TIMER button must be OFF.
2) Both TIMER and POWER buttons are ON, and "real time" is within the range set on the timer.

2. Initial operations after power ON

1) In absence of a cassette, all mode indicators are OFF and the signal system enters the E-E (electric-to-electric) mode.
2) With a cassette present, if both the cassette load end switch and the eject end switch are off, the Eject mode is entered.
3) When the mechanism is in modes other than Stop, after unloading, the Stop (E-E) mode is entered.

3. Power OFF

In the power OFF state, the front panel OPERATE button indicator is extinguished and all operations, including cassette insertion and removal, are inhibited. The power OFF state is attained by:

1) Setting the front panel OPERATE button to OFF or setting power off from the remote control unit. In modes other than Stop, unloading is performed, then the power OFF state entered.
2) Setting the front panel TIMER button to ON. When this is performed during Play, Recording or Insert, the mechanism first enters Timer Standby, then proceeds to power OFF. During Instant Recording, power OFF is not produced.
3) The above cases apply when the safety tab of the cassette is present. If the tab is absent, the cassette is ejected, then power OFF attained.

4. Cassette housing

1) Cassette loading is performed when the cassette in detect switch closes. At this time, if the switch opens within 0.7 sec. the Eject mode is entered.
2) If the cassette loading operation does not complete within approximately 8 seconds, the Eject mode is entered.
3) If the eject operation does not complete within approximately 8 seconds, the power OFF state is attained.

5. Automatic operations

A] Auto-stop mode entry

1) When beginning of tape is reached in Rewind or Search Reverse mode. The leader portion of the tape is detected, at which time the tape is transported in the forward direction until the leader tape clears the detector, then the Stop mode is entered.
2) Tape memory switch ON in Fast Forward or Rewind mode, and the tape counter reaches "0000" indication.
3) If the Pause/Still/Slow mode continues for longer than 5 minutes 25 seconds.
4) During Play, Recording or Search Forward mode, if the take-up reel disk rotation stops for longer than approximately 5 seconds.
5) In Search Reverse, Fast Forward or Rewind mode, if either the take-up or supply reel disk rotation stops for longer than about 5 seconds.
6) Drum motor rotation stops for longer than approximately 2 seconds in the Play, Record, Pause, Still or Search mode.
7) Loading operation does not complete within about 8 seconds after starting.

B] Auto-Eject mode entry

1) When end of tape is reached in Timer Recording or Instant Recording mode. After Eject, power is switched off.
2) During cassette loading, after cassette in detect switch closes, if the switch does not open within approximately 0.7 second.
3) If cassette loading operation does not complete within about 8 seconds.
4) Start and end sensors activated simultaneously.
5) REC safety switch opens during Recording mode.
6) Cassette safety tab absent and Timer or Instant Recording selected. If Timer Recording, after Eject, power is switched off.

C] Auto-Rewind mode entry

At end of tape in the Play, Record, Search Forward or Fast Forward mode.

D] Automatic Recording mode entry

1) Two seconds prior to programmed time for Timer Recording.
2) During Insert Recording, when the control signal cannot be detected. After approximately 0.8 second, the REC LED lights and the control signal is recorded. At this time, the full erase head is off.

E] Automatic power ON/OFF

1) Ten seconds prior to the start of Timer Recording, power is switched on; at the end of Timer Recording, power is switched off.
2) In event of commercial power loss, at the return of power, unloading is performed and power switched off, regardless of the OPERATE and TIMER button settings. If this occurs during Timer Recording, unloading is performed, then the Recording mode is entered.
3) In Timer standby state, if the OPERATE button is set to OFF, unloading is performed, then power is switched off.
4) If Eject or unloading operation does not complete within approximately 8 seconds, power is switched off.
5) At completion of Instant Recording, unloading is performed, then power switched off.
6) When end of tape is reached in Timer or Instant Recording, Eject is performed, then power is switched off.

7) During Timer Recording, if the safety tab is absent from the cassette, Eject is performed then power is switched off.

6. **Timer mode**

1) Ten seconds prior to Timer Recording, power is switched on and the Pause mode entered. Recording starts two seconds before the programmed time. At completion of the programmed time, the mechanism assumes the Timer standby state and power is switched off. During Timer Recording, all operating controls are inhibited.
2) If both Timer and OPERATE buttons are ON, but the safety tab is absent from the cassette, Eject is performed, then power is switched off.
3) During Timer Recording, if the OPERATE or TIMER button is set to OFF, unloading is performed and the power is switched off. The timer program for this particular event becomes erased.
4) At end of tape in Timer Recording, Eject is performed and power switched off. The timer program for this particular event becomes erased.

7. **Instant Recording**

1) With OPERATE button ON and safety tab of cassette present, the Instant Recording command is registered regardless of the mode in progress. At completion of Instant Recording, unloading is performed and power is switched off. During Instant Recording, only the SP/LP select and STOP buttons are enabled.
2) During Instant Recording, if the OPERATE button is set to OFF, unloading is performed and power is switched off. If the end of tape is reached, Eject is performed and power is switched off.
3) If the safety tab is absent from the cassette and the Instant Recording button pressed, Eject is performed.

1.7.2 Switches and sensors

1. REC SAFETY switch
   This switch, built into the cassette housing detects the presence or absence of a cassette's tab for erase protection. When a tab exists, the switch turns on. In case this switch is in OFF, the machine doesn't enter REC or REC PAUSE mode.
2. CASSETTE-IN DETECTOR switch
   Two cassette-in detector switches detect if a cassette is inserted.
3. CASSETTE LOAD END switch
   This detects the cassette housing in the lower state. When this switch is turning on, the cassette housing is fixed by the torsion spring.
4. EJECT END switch
   This detects the cassette housing in the up state. When this switch is turned on, the cassette is completely ejected from the machine.
5. START sensor
   This detects the leader tape portion of a cassette tape. When the leader tape is detected, this sensor turns on.
6. END sensor
   This detects the trailer portion of a cassette tape. When the trailer tape is detected, this sensor turns on.
7. TAKE-UP REEL sensor
   This detects rotation of the take-up reel disk.
8. SUPPLY REEL sensor
   This detects rotation of the supply reel disk.
9. LOADING sensor
   A sensor for setting a mode of the mechanism.

Table 1-7-1 shows the allowed shifts from a mode in progress to another mode.

MODE / KEY	STOP	PLAY	STILL	SLOW SEARCH	FF	REW	REC	REC PAUSE	A. DUB PLAY	A. DUB PAUSE	INSERT PLAY	INSERT PAUSE	INSTANT REC	TIMER REC
STOP		○	○	○	○	○	○	○	○	○	○	○	○	X
PLAY	○		○	○	○	○		○ (REC PLAY)		○ (A. DUB PLAY)		○ (INS. PLAY)	X	X
PAUSE STILL	X	○	○ (FADV)	○	X	X	○ (REC PAUSE)		○ (A. DUB PAUSE)	○ (FADV)	○ (INS. PAUSE)		X	X
SLOW SEARCH	X	○	○	○ (VSCH)	X	X	X	X	X	X	X	X	X	X
FF	○	○ (S. FF)	○ (S. FF)	○ (S. FF)		○	X	X	X	X	X	X	X	X
REW	○	○ (S. REW)	○ (S. REW)	○ (S. REW)	○		X	X	X	X	X	X	X	X
REC PLAY	○	○	○	○	○	○		○	○	○	○	○	X	X
REC PAUSE	○	○	○	○	○	○	○		○	○	○	○	X	X
A. DUB PLAY	○	○	○	○	○	○	X	X		○	X	X	X	X
A. DUB PAUSE	○	○	○	○	○	○	X	X	○		X	X	X	X
EJECT	○	○	○	○	○	○	X	X	X	X	X	X	X	X
INSTANT REC	○	○	○	○	○	○	○	○	○	○	○	○	○ (*1)	X
CH. UP DOWN	○	X	X	X	○	○	X	○	X	X	○	○	X	X

Table 1-7-1 Mode shift table

Notes:

○ : Enabled (mode changes)

X : Inhibited (mode does not change)

*1 : Rec time advance

1.8 TUNER/TIMER CONTROL OPERATIONS

Item	Conditions	Displays and Operations
1. Display of Power Failure	1) In the conditions of: AC - IN Mains Power Switch - ON OPERATE button - OFF	" SUN " CLOCK 0:00 is displayed and all figures (showing time) blink.
	2) In the condition of 1) above: OPERATE button - ON TIMER button - ON	Does not release 'Power Failure Display'.
2. Clock Setting	1) In the condition of: Mains Power Switch - ON, CLOCK ADJ. button pressed with OPERATE button - ON and TIMER button OFF.	Releases 'Power Failure Display'. (Blinking of figures stops.) " SUN " CLOCK 0:00 displayed.
	2) CLOCK ADJ. button and DAY button are simultaneously pressed.	On the display the day of week changes one after another, with every pressing of the DAY button. → SUN → MON → TUE → WED → THU → FRI → SAT
	3) CLOCK ADJ. button and HOUR button pressed simultaneously.	On the display, figure(s) showing the hour advances with every pressing of HOUR button. (DAY display does not change.) → 0 → 1 → 2 → . . . . 21 → 22 → 23
	4) CLOCK ADJ. button and MIN (+) or MIN (–) button pressed simultaneously.	Figure(s) displaying minute increases or decreases with every pressing of MIN (+) or MIN (–) button. (Figure[s] showing HOUR does not change.) → 00 ↔ 01 ↔ 02 ↔ 03 . . 57 ↔ 58 ↔ 59
	5) Setting order of DAY, HOUR, MIN (+) or MIN (–)	Any button is operative without regard to other displays.
	6) Automatic advancement (setting back minute)	Depressing DAY, HOUR or MIN (+) button for 1 and more second (s) advances related display +1. (MIN [–] is the same for setting back.)
3. Program Setting	1) PROGRAM button is pressed once at the present time diaplay.	Displays as follows: REC SP 1st SUN START – – : – – STOP – – : – – PROG – – 1 or Displays the contents of the program No. 1 pre-set. *If status is held for longer than approximately 1 minute, the present time indication is returned.
	2) START button is pressed in the condition of above 1).	"START" blinks on the display.
	3) DAY, HOUR, MIN buttons pressed in the above condition 2).	Displayed figure(s) corresponding to the pressed button increases or decreases. (DAY of the program changes as follows:) → 1st SUN → 1st MON →--→ 1st SAT → 2nd SUN → -- SUN ~ SAT ← 2nd SAT ←
	4) In the case START (switch-on time) is not yet set is the condition of the above 1).	Impossible to set STOP (switch-off time).
	5) STOP button is pressed in the condition that START has been set.	If STOP has not been set ("– – : – –" is displayed), the time of START is copied and "STOP" on the display blinks.
	6) In the case both START and STOP have been set.	"STOP" on the display blinks.

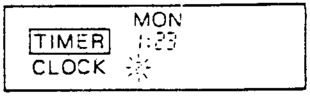
Item	Conditions	Displays and Operations
	7) DAY, HOUR and MIN buttons pressed in the condition of 5) and 6) above.	Displayed figure(s) corresponding to the button(s) pressed increases or decreases.
	8) CH button pressed.	"PROG" on the display blinks.
	9) In the condition that "PROG" on the display is blinking: CH UP/DOWN buttons pressed.	Figure(s) dispalying channel No. increased or decreases.
	10) SP/LP button is pressed in the condition of 1) above. (Selection of REC mode)	"SP" or "LP" is alternately displayed every pressing of the button.
	11) REPEAT button pressed.	"REPEAT" lights on the display or turns off.
	12) CANCEL button pressed.	All displays are set back to the initial stage respectively.
	13) PROG button pressed in the condition of 1) through 11) above.	Displays contents of the program next to the program No. displayed just before the switching.
4. Programmable Timer Recording	1) OPERATE button - OFF and TIMER button - ON in the condition that a cassette with safety tab is loaded and a (and more) program(s) is correctly set.	"TIMER" on the dispaly blinks as far the condition 1) left continues. No recording of the program.
	2) Both OPERATE button and TIMER button are OFF in the same condition as 1) above.	"TIMER" on the display does not light nor blink. No recording of the program.
	3) Both OPERATE button and TIMER button are ON in the same condition as 1) above.	"TIMER" lights on the display and figure(s) equivalent to the program(s) possible record also lights. Example: 
	4) In the case of 3) above, the program starts being recorded 10 seconds before the set time.	POWER automatically turns on (PRE-START output is output by the timer). REC mode of SP or LP is selected according to the program.
	5) For the period of 8 seconds from the condition 4) above to 2 sec before the start.	The machine enters REC PAUSE mode. Display of the program No. to record changes from lighting to blinking.
	6) In the condition of 3) above, it is 2 sec before (−2 sec) the set start time.	PAUSE mode is released and the tape starts running. (REC START output is turned out by the timer.)
	7) Through the period from START − REC − to END in the condition of 3) above.	The program No. under recording blinks on the display.
	8) Time is up to the ending time set for the program.	Recording stops. (REC START OFF signal is turned out by the timer.)
	9) In the case the following program is recorded in the above manner (up to 8)).	
	(1) Program is Not REPEAT DAILY.	(1) The machine turns back to the initial stage after recording is completed. At the same time the recorded program No. that has blinked on the display turns out.
	(2) Not REPEAT but DAILY.	(2) After completion of recording the day of week that the recording was performed is deleted from the program.
	(3) REPEAT.	(3) After completion of recording the program No. of the recorded one continues lighting on the display. There are no changes in the contents of the program.

Table 1-8-1 T/T CTL operations

Item	Conditions	Displays and Operations
5. Counter Display	1) OPERATE button - ON OPERATE button - OFF	COUNTER display lights. COUNTER display turns off.
	2) COUNTER RESET button pressed once while COUNTER is displaying	COUNTER is forcibly set to "0000".
	3) COUNTER RESET button pressed once while COUNTER is not displaying.	COUNTER does not be set to "0000" forcibly.
	4) FF or REW button pressed while TAPE MEMORY switch is ON.	COUNTER resets the value "0000 ±2" and stops operation. (COUNT 0 signal is turned out of the timer.) Reset in FF : in the range of 0000–0002 REW: in the range of 0000–9998
	5) FF or REW button pressed while TAPE MEMORY switch is OFF.	After COUNTER reads "0000" the operation mode continues.
	6) RESET button pressed in the state of 4) above.	COUNTER is forcibly reset to "0000" and tape running stops.
	7) COUNT/REMAINING button pressed once while COUNTER is displaying numbers.	Display changes from "COUNTER XX XX" to "REMAIN XX:XX" or "REMAIN ––:––".
	8) After the process of 7) above, COUNT/REMAINING button pressed once again.	Display changes from "REMAIN ...." to "COUNTER ....".
	9) COUNTER value goes UP or DOWN regardless COUNTER display.	
6. Tape Remaining Time Display	1) COUNT/REMAINING button pressed while COUNTER is displaying numbers.	"REMAIN" display appears as follows. "REMAIN – – : – –"
	2) Machine mode is set to REC, PB or SEARCH.	"REMAIN XX:XX" display appears after figuring out the remainder tape.
	3) Machine mode is set to FF or REW.	The same display as 1) above appears.
	4) STOP button pressed in the condition of 2) above.	"REMAIN XX:XX" display remains.
	5) STOP button pressed in the condition of 3) above.	The same display as 1) above appears.
	6) COUNT/REMAINING button pressed while "REMAIN display" is appearing.	Display changes to "COUNTER display".
7. Instant Recording	1) INSTANT REC button pressed once while OPERATE button is ON.	Display of "COUNTER ..." or "REMAIN ..." changes to "REC STOP – – : – –", and REC STOP light blinks. Channel switching becomes possible.
	2) The machine is left in the condition of 1) above for 10 and more seconds.	"REC STOP – – : – –" display changes "COUNTER display".
	3) INSTANT REC button pressed once again after the process 1) above.	"REC STOP 0:30" display appears and the machine enters REC mode.
	4) INSTANT REC button pressed several times after the process 3) above.	Displayed time advances 30 minutes by 30 minutes every pressing of the switch. Example: 0:30 → 1:00 → ...... → 4:00 ---- ↑ ———— 0:00 ←
	5) HOUR and MIN buttons pressed in the state of 3) above.	Time setting on a unit of 1 minute is possible. (Max. 4 hours 59 minutes)
	6) When "REC STOP 0:00" is displayed.	Recording is completed 10 seconds after the display. At the same time power turns off and "REC STOP 0:00" display disappears.

Item	Conditions	Displays and Operations
	7) OPERATE button is turned on and a cassette with safety tab is loaded.	By pressing INSTANT REC button the machine enters INSTANT REC mode.
	8) OPERATE button is set to ON but there is no power for operation.	By pressing INSTANT REC button operative power comes and the machine enters INSTANT REC mode.
	9) When a cassette without safety tab is loaded and OPERATE button is ON.	Pressing INSTANT REC button does not enter the machine into INSTANT REC mode but ejects the cassette.
	10) Without any cassette loaded.	Pressing INSTANT REC button does not enter the machine into INSTANT REC mode.
8. Others	1) CLOCK button pressed while PROGRAM is displayed.	Display changes to CLOCK display.
	2) REC SELECT switch is set to TV and OPERATE button is ON.	Pressing CH UP/DOWN button changes displayed channel No. up or down.

Table 1-8-1 T/T CTL operations

Notes :

SECTION 2
MECHANICAL ADJUSTMENTS

2.1 GENERAL

2.1.1 Precautions

- IMPORTANT

1. Disconnect from power before removing or soldering components.
2. The tape transport mechanism has been precisely adjusted at the factory and ordinarily does not require re-adjustment.
3. Tighten the screws carefully to avoid damage to the chassis.

2.1.2 Required test equipment, jigs and tools

For proper mechanical adjustment, the following jigs and tools are strongly recommended. Without them, a long trial-and-error period would be necessary, resulting in possible damage. In addition, general-purpose tools and a metric hex key (obtain locally) are required.

Test equipment required :

Color television or monitor
Oscilloscope : wide-band, dual trace, triggered, delayed sweep

Recording tape
Alignment tapes

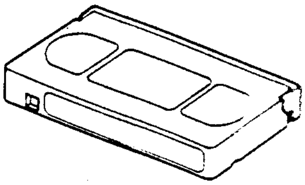
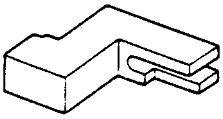
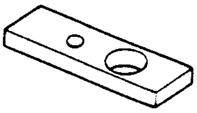
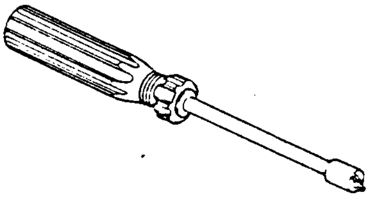
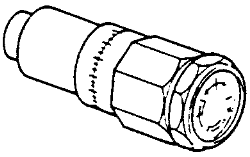
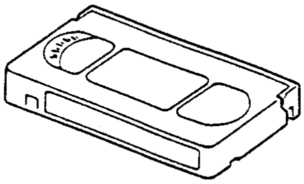
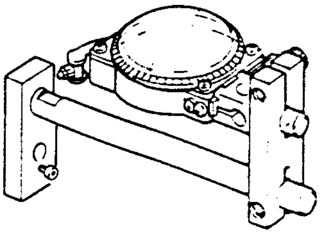
Alignment tape (79V20196/79V29907) 	Height gauge 79V29903 	Spacer (for micro-checker) 79V29904 
Tapered nut driver 79V29908 	Torque gauge ass'y 79V20199 	Back tension cassette gauge 79V20202 
Micro-checker 79V20486 		

Table 2-1-1 Jigs and tools

Note: See section 3.2 required test equipment and jigs regarding electrical adjustments.

2.1.3 Disassembly

1. Top cover and bottom plate

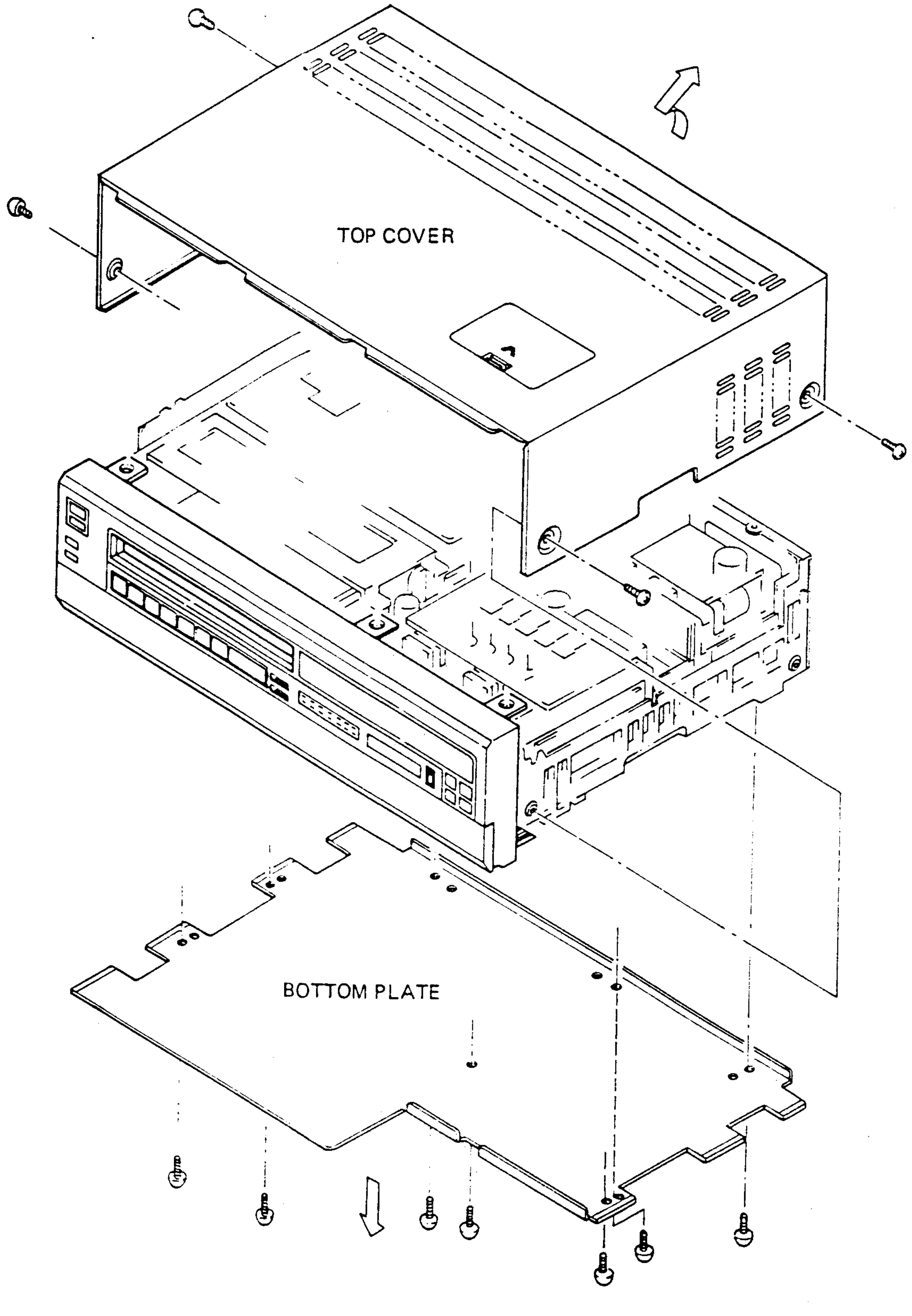

TOP COVER
BOTTOM PLATE

Fig. 2-1-1 Top cover/bottom plate

2. Front panel and rear panel

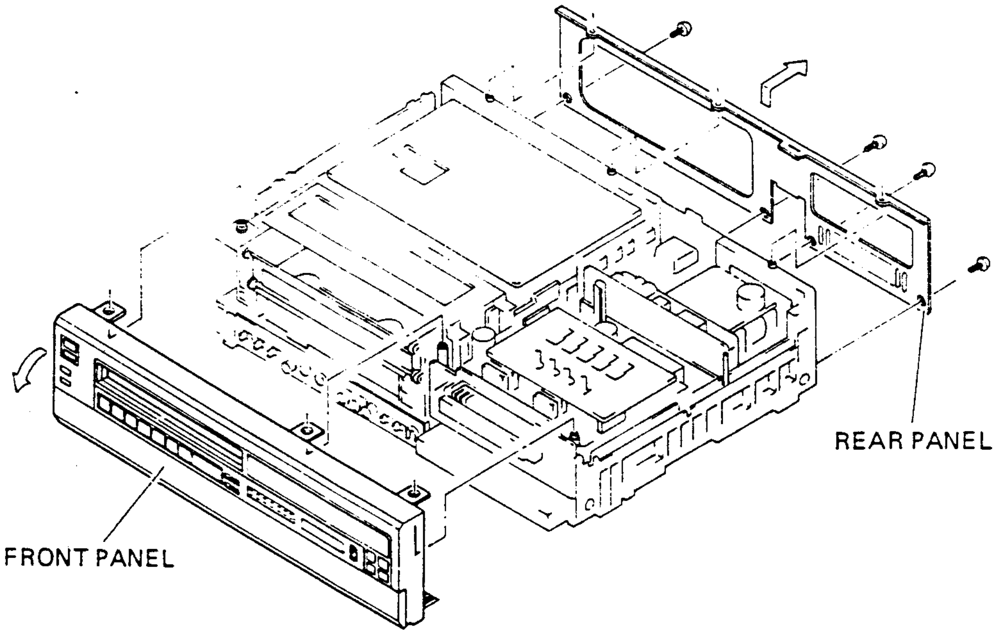

REAR PANEL
FRONT PANEL

Fig. 2-1-2 Front panel/rear panel

3. Cassette doors

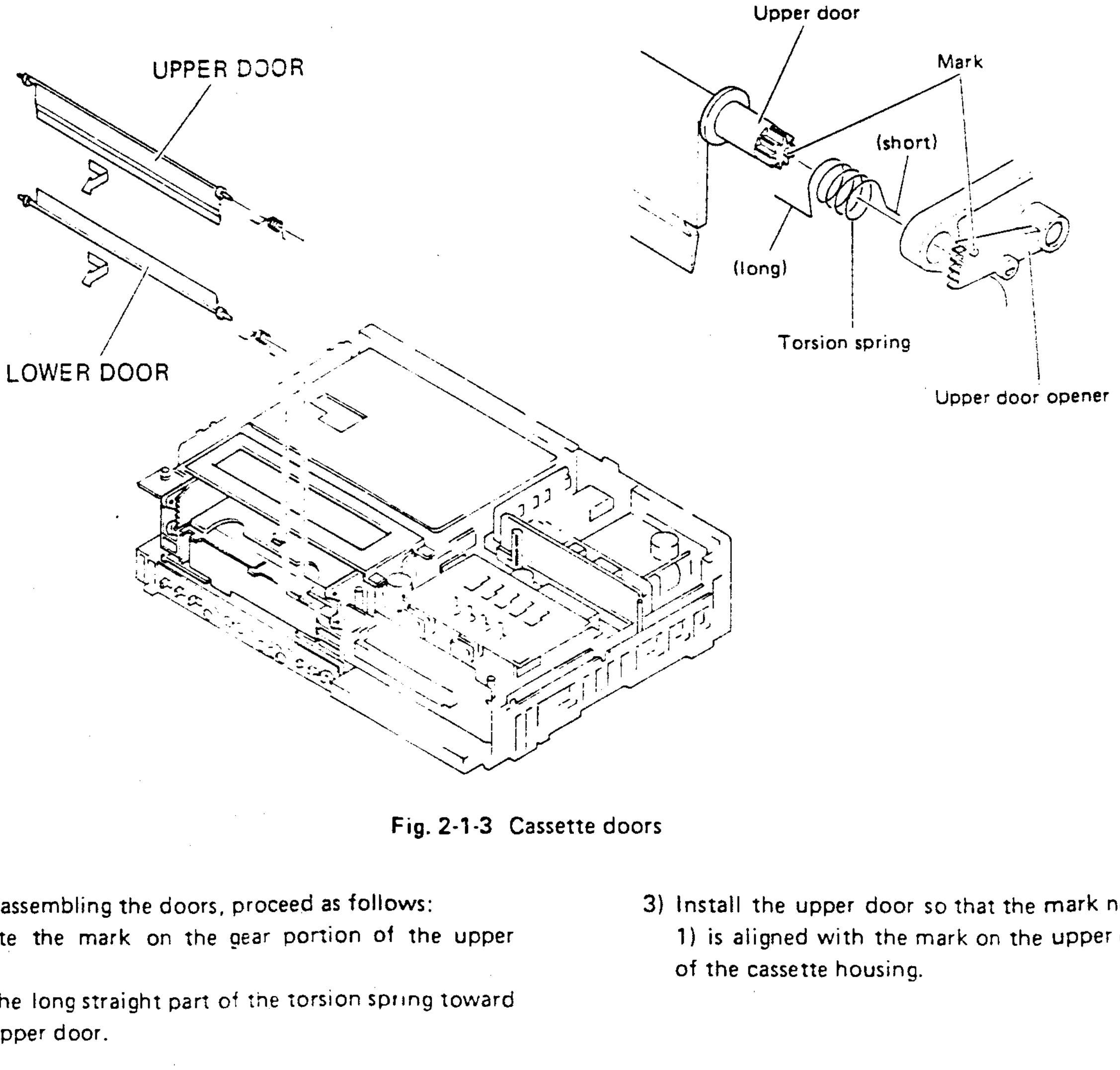

UPPER DOOR
LOWER DOOR
Upper door
Mark
(short)
(long)
Torsion spring
Upper door opener

Fig. 2-1-3 Cassette doors

Notes:

When reassembling the doors, proceed as follows:

1) Locate the mark on the gear portion of the upper door.
2) Set the long straight part of the torsion spring toward the upper door.
3) Install the upper door so that the mark noted in Step 1) is aligned with the mark on the upper door opener of the cassette housing.

2.2 PERIODIC MAINTENANCE

The following procedures are recommended for maintaining optimum performance and reliability of this video cassette recorder.

2.2.1 Layout of maintenance parts

1. Top view

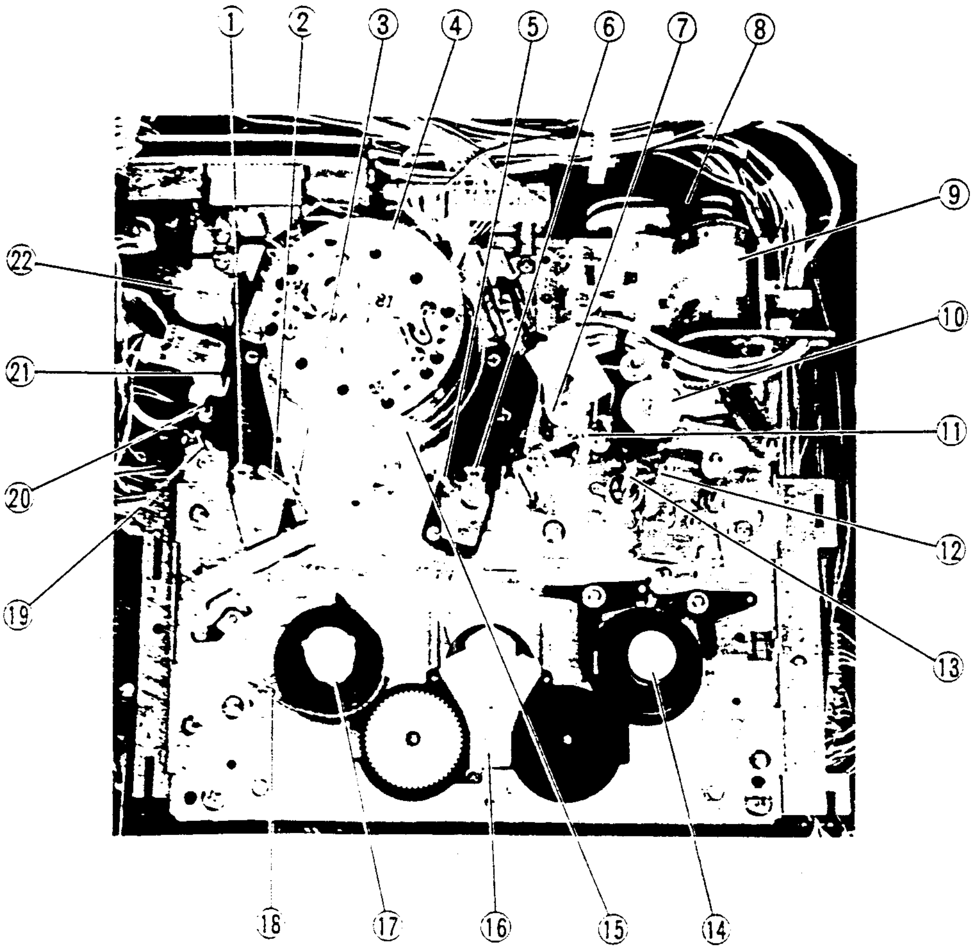

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Fig. 2-2-1 Top view

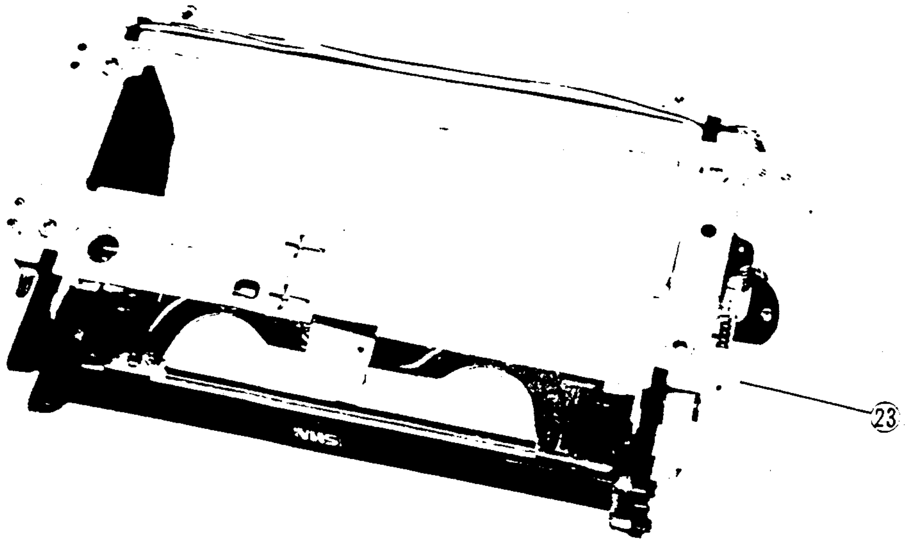


Fig. 2-2-2 Cassette housing

2. Bottom view

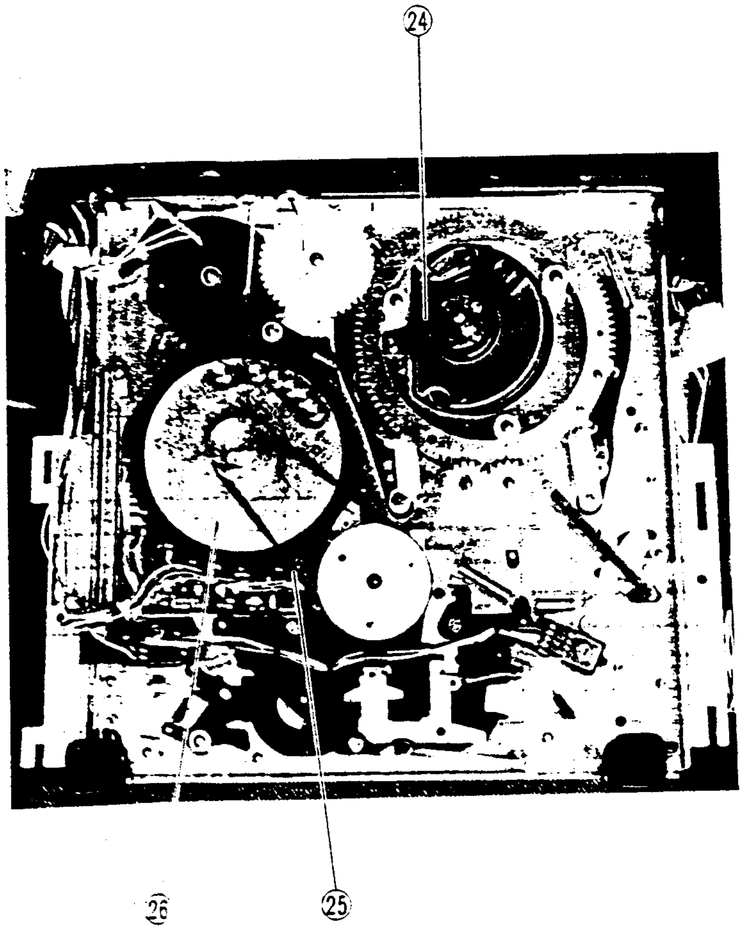


Fig. 2-2-3 Bottom view

1 SUP guide roller
2 SUP slant pole
3 Tension pole
4 Upper drum
5 T.U. slant pole
6 T.U. guide roller
7 Audio/Control head
8 Loading belt
9 Mode control motor
10 Pinch roller
11 T.U. guide pole
12 Guide arm
13 Capstan
14 T.U. reel disk
15 Lower drum
16 Clutch mechanism
17 SUP reel disk
18 Tension band
19 SUP guide pin
20 SUP guide pole
21 Full erase head
22 Impedance roller
23 Cassette motor
24 Brush
25 Reel belt
26 Capstan motor

2.2.2 Service schedule for main components

The following table lists the parts which should receive periodic servicing at the recommended intervals.

	Part Name	Replacement Part No.	Periodic Service Schedule (Operating Hours)										Reference Section	Remarks
			500	1000	1500	2000	2500	3000	3500	4000	4500	5000		
Tape transport system	Tension pole SUP slant pole SUP guide roller SUP guide pin SUP guide pole Impedance roller TU guide pole Capstan Guide arm TU guide roller TU slant pole Lower drum		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆		• For cleaning, use a lint-free cloth or gauze dampened with alcohol. • After cleaning with alcohol, allow the parts to dry thoroughly before using a cassette tape.
	Upper drum		☆	○	●	☆	○	●	☆	○	●	☆	2.3.2	— When cleaning the head tips on the upper drum, do not clean them with a vertical stroke. Use only a gentle back and forth motion in the direction of the tape path.
	Full erase head		☆	☆	☆	☆	☆	☆	☆	☆	☆	○	2.3.3	
	Audio/control head		☆	☆	☆	☆	☆	●	☆	☆	☆	☆	2.3.4	
	Pinch roller		☆	☆	☆	☆	☆	●	☆	☆	☆	☆	2.3.5	
Drive system	Capstan motor											○	2.3.6	
	Reel belt			☆		●		☆		●		☆		
	Mode control motor											○	2.3.7	
	Loading belt			☆		●		☆		●		☆		
	Cassette motor											○	2.3.8	
	SUP reel disk TU reel disk					△				△		○	2.3.9	— Do not over lubricate..
	Clutch mechanism			○		○		○		○		○	2.3.10	— Torque check (refer to section 2.4.3).
Others	Brush		☆	☆	☆	☆	☆	☆	☆	☆	☆	○	2.3.11	
	Tension band			○		○		○		○		○	2.3.12	— Back tension check (refer to section 2.4.4)

☆ Cleaning ● Replacement △ Lubrication ○ Check and Replace if necessary.

Table 2-2-1 Standard service periods

Above replacement times will vary greatly according to environmental and usage conditions. Routine inspection and maintenance are also important factors that influence the unit life. Note that rubber parts may become aged or deformed after long periods of storage, even if the unit is not used.

Notes:

1) Even if the unit is not used frequently, cleanir lubrication and replacement of the belts shou be undertaken every 2 years.
2) Refer to Section 5 Parts List regarding replac ment parts of Table 2-2-1. Note that Part numbe are subject to change without prior notice.

.3 MAIN ASSEMBLY REPLACEMENT

Remove the external covers and the circuit boards, as necessary, to allow replacement.

.3.1 Cassette housing

- Removal of cassette housing

1. Disconnect connector CN1, coming from A/S/M board, from CASS. HOUSING board.
2. Take out four screws ① and remove the earth plate.
3. Carefully lift the cassette housing upwards to remove it.

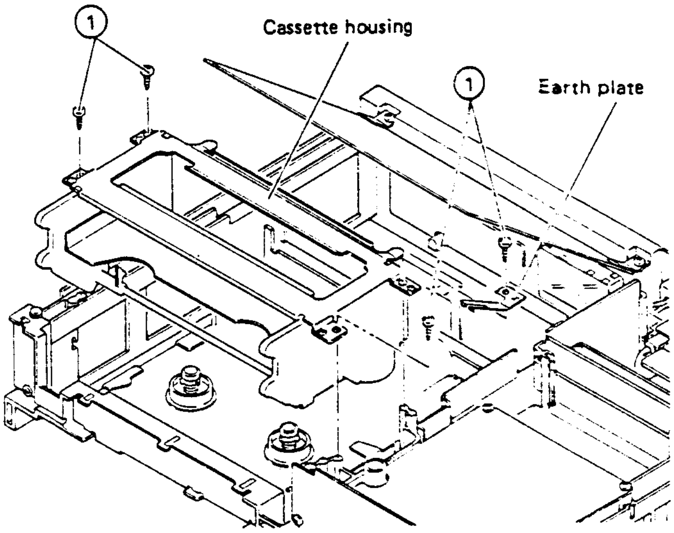


Fig. 2-3-1 Removal of cassette housing

- How to operate the set without loading a tape

For service procedures that call for operation of the set without loading the tape around the head drum, extract the cassette housing from the interior of the set and position it as described below.

1. Set a sheet of insulated material (cardboard, plastics, etc.) on the right side of chassis, above the T/T CTL board.
2. Remove the cassette housing from the interior of the set and place it on the insulated sheeting, but do not disconnect the connector from the A/S/M board.
3. Insert a cassette into the cassette housing. The housing mechanism functions to retract the cassette.
4. Since the required sensors are contained within the housing, after the cassette has been retracted, the desired modes can then be obtained by using the operation switches.

2.3.2 Upper drum

1. Unsolder the twelve wires connecting the lower drum from the relay pins of the upper drum (perform quickly to avoid damaging the wires).

Relay Pin Color	Channel	Inner/Outer Wire Color
Brown	SP, CH-1	Brown/Green
Red	SP, CH-2	Red/White(clear)
Blue	LP, CH-1	Blue/Black
Orange	LP, CH-2	Orange/Yellow
Gray	A-1	Violet/Light green
Gray	A-2	Gray or Pink/White

Table 2-3-1 Upper drum wiring

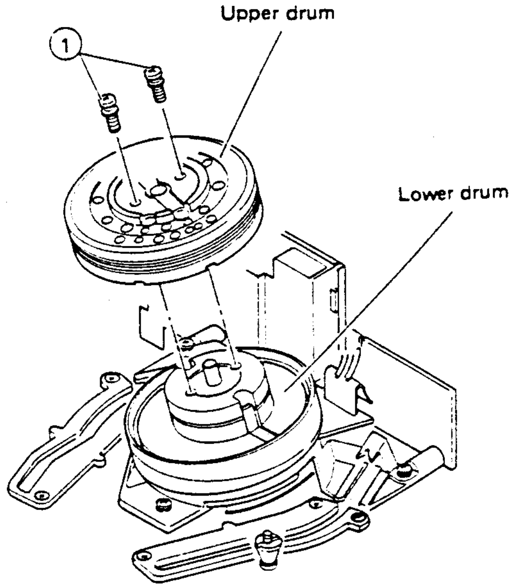
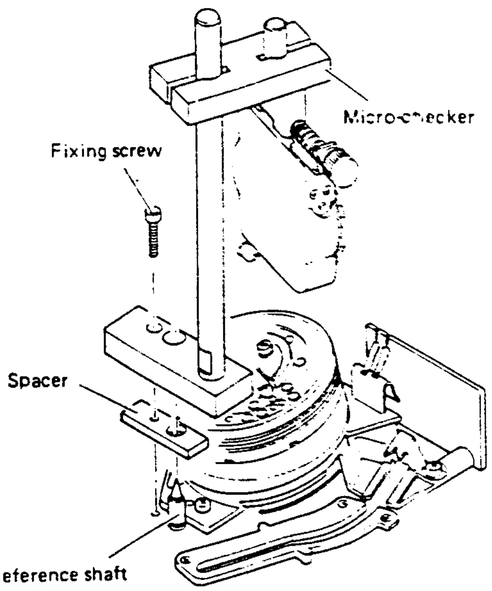


Fig. 2-3-2 Upper drum replacement

2. Take out two screws ① and remove the upper drum in the upward direction.
3. Use alcohol to clean the lower face of the new upper drum and the upper face of the lower drum. When handling and installing the new upper drum, avoid directly touching the head tips and use care not to scratch the drum.
4. Reassemble by reversing the above steps. When resoldering, observe the correct channels (refer to Table 2-3-1) and avoid overheating the wires.
5. Perform the upper drum eccentricity adjustment.
   1) Supply power and set for the Play mode without a cassette housing (refer to section 2.3.1). After completion of loading, disconnect from power.
   2) Take out a screw and remove the earth plate. Set the micro-checker on the reference shaft as shown in Fig. 2-3-3. Use the accessory hex wrench (metric) to tighten the fixing screw.

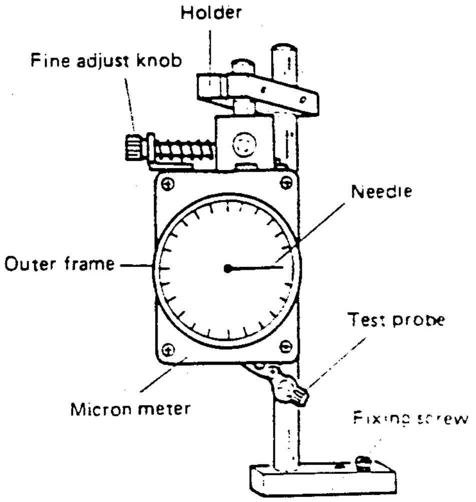
CAUTION: The micro-checker is a test jig for measuring eccentricity of the upper drum.
When using this jig, observe the following precautions.



Micro-checker
Fixing screw
Spacer
Reference shaft

Fig. 2-3-3 Micro-checker mounting

- As the instrument is extremely precise, use special care not to drop it or subject it to strong vibration.
- Do not apply strong force to the test probe (Fig. 2-3-4).
- The outer frame of the scale can be turned about 7 scale divisions. Do not turn it forcibly (force greater than 300 g-cm).
- Use care that the jig does not contact the video heads.
- Before mounting, turn the fine adjust knob counter clockwise (to where the spring tension is no longer felt).
- Do not apply power while the jig is installed.



Holder
Fine adjust knob
Needle
Outer frame
Test probe
Micron meter
Fixing screw

Fig. 2-3-4 Micro-checker

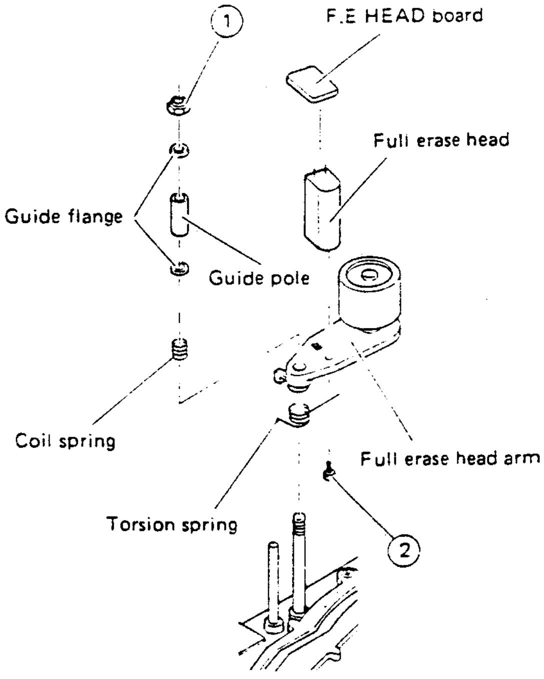
3) Check and readjust the micro-checker position. The correct position is:
   - The test probe contact point is 2 or 3 mm under the top of the upper drum.
   - The test probe movement direction is toward the center portion of the upper drum.

4) Gradually turn the fine adjust knob clockwise so that the test probe contacts the upper drum. The dial indicator registers zero on the scale.
5) While using care not to apply lateral pressure to the upper drum, slowly turn the upper drum and read the deviations indicated by the micro-checker.
6) Check for needle deflection within 4 microns.
7) If deviation is greater than 4 microns, after turning the fine adjust knob counterclockwise to disengage the test probe from the upper drum, loosen two screws ① and carefully readjust the upper drum position, then retighten the two screws in a balanced manner. Repeat above steps 4) to 6).
8) After using, turn the fine adjust knob counterclockwise and remove the micro-checker.
9) Supply power and set for the Stop mode.

6. Perform the interchangeability adjustment (refer to section 2.4.6).

2.3.3 Full erase head

1. Unsolder the two terminals coming from the full erase head and remove the F.E. HEAD board.
2. Take out nut ① and remove the guide pole, guide flanges and coil spring.
3. Unhook the torsion spring from the full erase head arm and remove the full erase head arm in the upward direction.
4. Take out screw ② to remove the full erase head.
5. Replace the full erase head and reassemble by reversing the above steps.
6. Perform the guide pole height adjustment (refer to section 2.4.5).



①
F.E HEAD board
Full erase head
Guide flange
Guide pole
Coil spring
Full erase head arm
Torsion spring
②

Fig. 2-3-5 Replacement of F.E head

2.3.4 Audio/control head

1. Take out screw ① to remove the bracket and shield cap.
2. Take out nut ② and remove the washer.
3. Unhook the torsion spring from the audio/control head and remove the audio/control head in the upward direction.

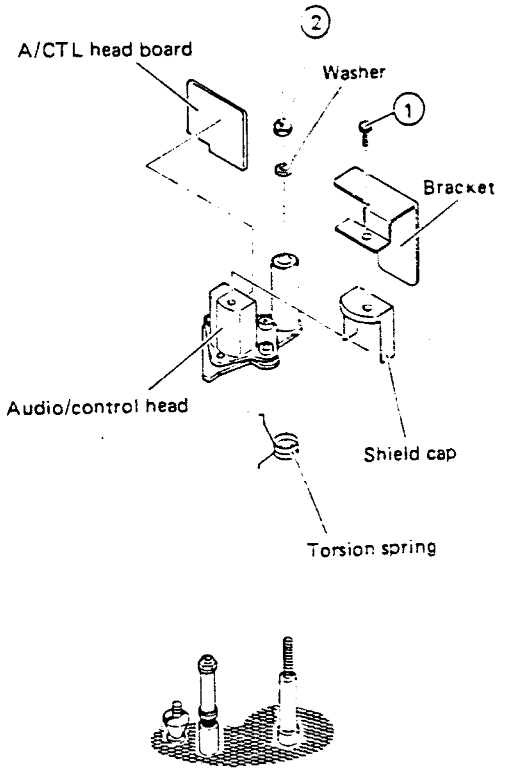

②
A/CTL head board
Washer
①
Bracket
Audio/control head
Shield cap
Torsion spring

Fig. 2-3-6 Replacement of A/CTL head

4. Unsolder the ten terminals coming from the heads and remove the A/CTL head board.
5. Replace the audio/control head and reassemble by reversing the above steps.
6. Turn the nut and preadjust the audio/control head height as shown in Fig. 2-3-7.

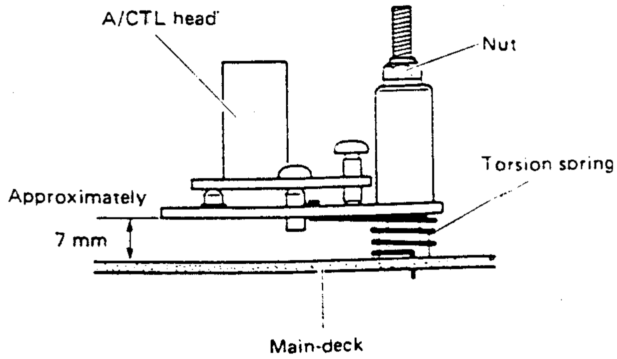

A/CTL head
Nut
Torsion spring
Approximately
7 mm
Main-deck

Fig. 2-3-7 A/CTL head height

7. Perform the tape transport/interchangeability checks and adjustments (refer to sections 2.4.5 and 2.4.6).

2.3.5 Pinch roller

1. Take out slit washer ① and slit washer ②, and remove the pinch roller arm in the upward direction.
2. After cleaning the pinch shaft, spread grease on it.
3. Replace the pinch roller arm and reassemble by reversing the above steps. Avoid staining the pinch roller with grease.

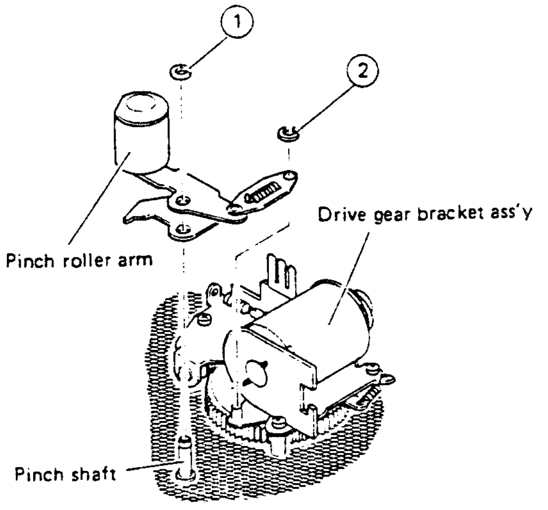

①
②
Drive gear bracket ass'y
Pinch roller arm
Pinch shaft

Fig. 2-3-8 Replacement of pinch roller

2.3.6 Capstan motor

1. Disconnect connectors CN209, CN405 and CN407 from the A/S/M board.
2. Disengage the motor wires from the clamps and pull out the two cables.
3. Disengage the reel belt from the capstan motor and the pulley of the clutch mechanism assembly.
4. Take out three screws ① and remove the capstan motor in the downward direction. Use care regarding the motor brake.
5. Replace the capstan motor and reassemble by reversing the above steps.
6. Perform the capstan DISCR. position adjustment (refer to section 3.5.3).

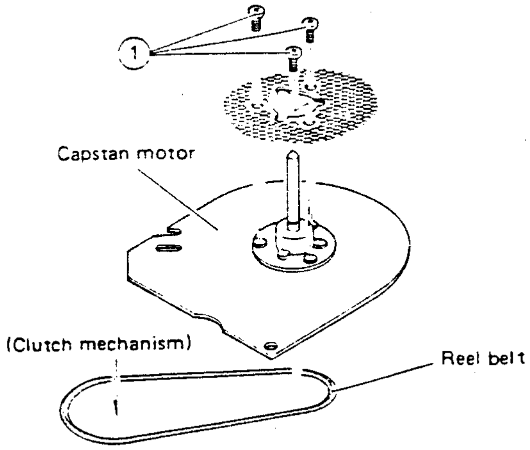

①
Capstan motor
(Clutch mechanism)
Reel belt

Fig. 2-3-9 Replacement of capstan motor

2.3.7 Mode control motor

1. Unsolder the two terminals coming from the motor and remove the MOTOR board. Use care regarding the clamped wires.
2. Take out slit washer ① and move the slide plate to the side.
3. Take out slit washers ② and ③, remove the cam arm upwards.
4. Take out three screws ④ and remove the drive gear bracket assembly upwards.
5. Disengage the belt, take out two screws ⑤ and remove the mode control motor.
6. Replace the motor and reassemble by reversing the above steps. Remount the motor so that the terminal with the ⊕ mark is soldered to the upper connection on the circuit board, as shown in figure.
7. Perform the loading gear (1) timing check (refer to section 2.4.1).

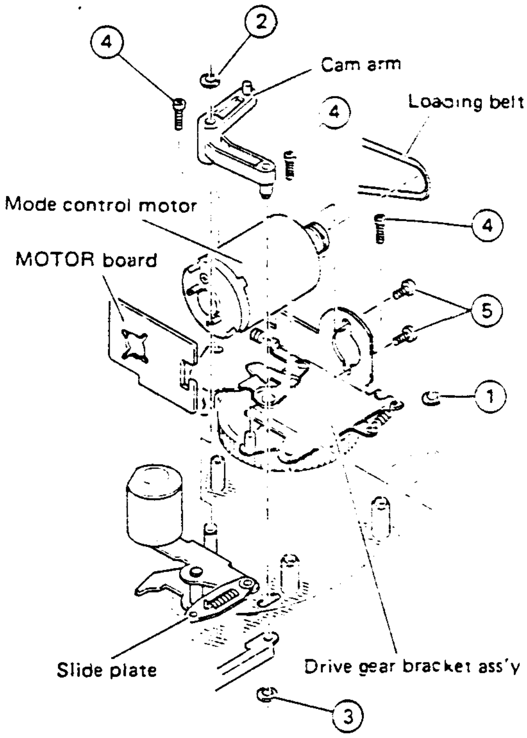

④
②
Cam arm
④
Loading belt
Mode control motor
④
MOTOR board
⑤
①
Slide plate
Drive gear bracket ass'y
③

Fig. 2-3-10 Removal of mode control motor

2.3.8 Cassette motor

1. Remove the cassette housing (refer to section 2.3.1).
2. Unsolder the two wires from the cassette motor.

Distinction	Wire Color
Thick boss	White
Thin boss	Gray

Table 2-3-2 Cassette motor wiring

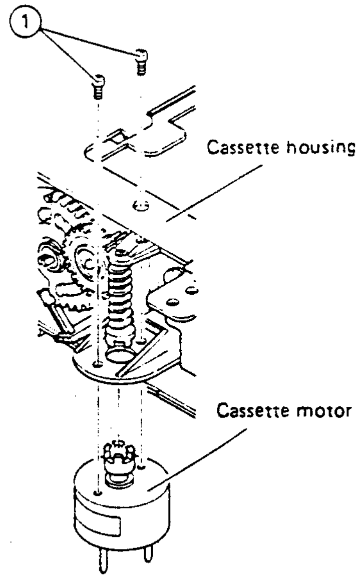

①
Cassette housing
Cassette motor

Fig. 2-3-11 Replacement of cassette motor

3. Take out two screws ① and remove the cassette motor.
4. Replace the cassette motor and reassemble by reversing the above steps. Use care regarding the motor wire polarity (refer to Table 2-3-2).
5. Reinstall the cassette housing into its original position.

2.3.9 Reel disks

- Supply reel disk

1. Take out slit washer ① and remove the supply loading brake with spring.
2. Take out screw ② and move the tension band to the side.
3. Take out slit washer ③ and remove the supply reel disk upwards. Use care regarding the washers.

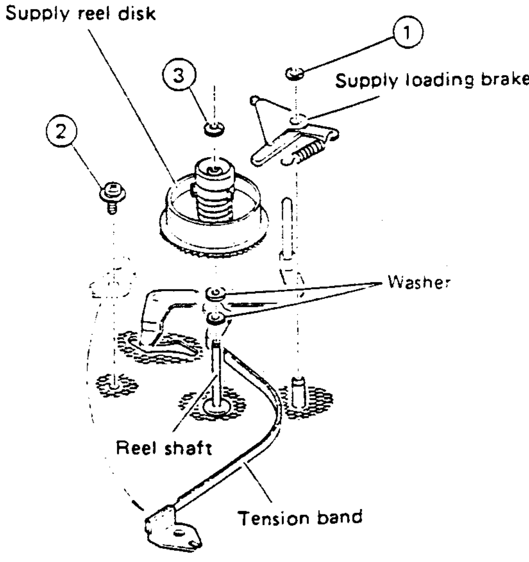

Supply reel disk
①
③
Supply loading brake
②
Washer
Reel shaft
Tension band

Fig. 2-3-12 Replacement of supply reel disk

4. After cleaning the reel shaft with alcohol, lubricate it with one drop of sewing machine oil. Do not over lubricate.
5. Replace and install the supply reel disk, and perform the reel disk height check (refer to section 2.4.5).
6. Mount the tension band and supply loading brake as before, and perform the tension pole position check (refer to section 2.4.2).
7. Perform the back tension check (refer to section 2.4.4).

- Take-up reel disk

1. Take out slit washer ① and remove the search brake with spring.
2. Take out slit washer ② and remove the take-up reel disk upwards while moving the take-up loading brake. Use care regarding the washers.
3. After cleaning the reel shaft with alcohol, lubricate it with one drop of sewing machine oil. Do not over lubricate.
4. Replace and install the take-up reel disk, and perform the reel disk height check in the same manner as the supply reel disk (refer to section 2.4.5).
5. Install the search brake as before.

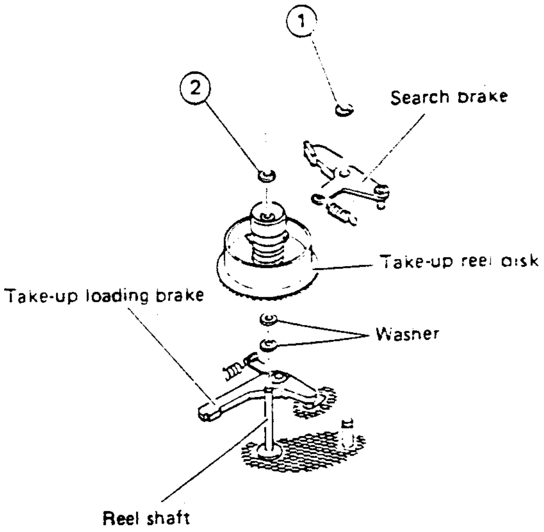

①
②
Search brake
Take-up reel disk
Take-up loading brake
Washer
Reel shaft

Fig. 2-3-13 Replacement of take-up reel disk

2.3.10 Clutch mechanism

1. Disengage the six springs from the clutch mechanism. These springs come from the supply loading brake, teke-up loading brake, main brake slider, supply main brake, take-up main brake and cancel lever.
2. Disengage the reel belt from the pulley of the clutch mechanism.
3. Take out screw ① and remove the supply reel sensor, then unhook the sensor wires from the hooks of the clutch mechanism.
4. Take out three screws ② and remove the clutch mechanism downwards.
5. Replace the clutch mechanism and reassemble by reversing the above steps.
6. Perform the take-up torque check (refer to section 2.4.3).

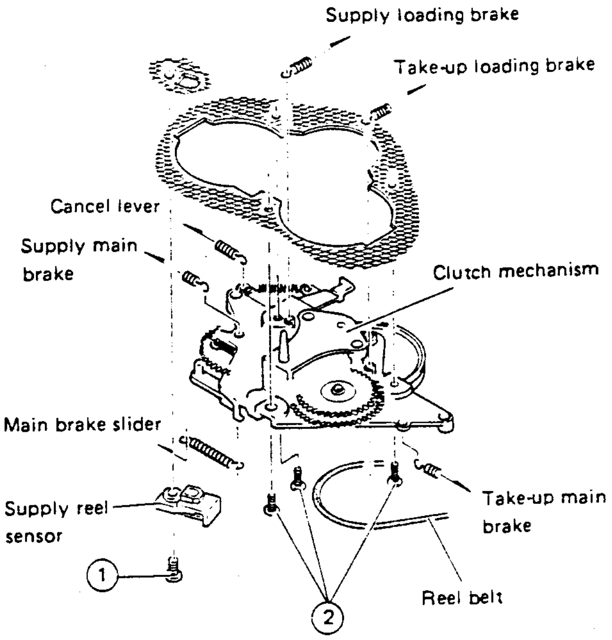

Supply loading brake
Take-up loading brake
Cancel lever
Supply main brake
Clutch mechanism
Main brake slider
Supply reel sensor
Take-up main brake
①
Reel belt
②

Fig. 2-3-14 Replacement of clutch mechanism

2.3.11 Brush

1. Take out screw ① and remove the brush, and clean the commutator with alcohol.
2. Replace and install the brush as before, check that the brush contacts the center of the commutator.

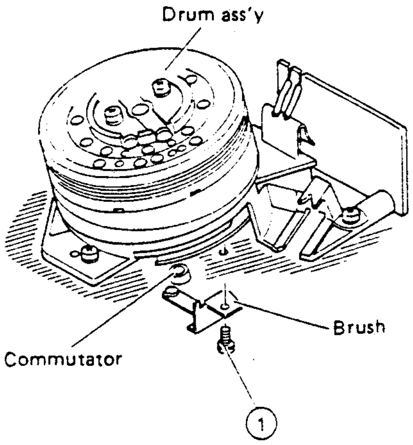

Drum ass'y
Brush
Commutator
①

Fig. 2-3-15 Replacement of brush

2.3.12 Tension band

1. Take out slit washer ① to remove the tension arm, and disengage the spring from the tension arm.
2. Take out slit washer ② and remove the supply loading brake with spring.
3. Take out screw ③ and remove the tension band and tension arm together in the upward direction. Use care regarding the washer.

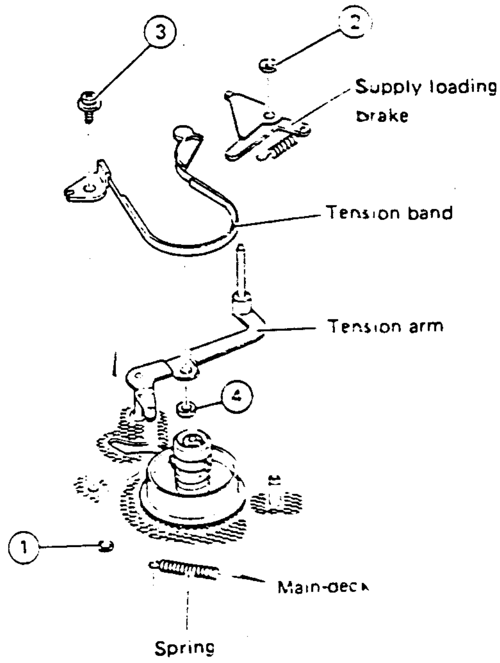


Fig. 2-3-16 Replacement of tension band

4. Take out slit washer ④ and disengage the tension band from the tension arm, and replace the tension band.
5. Clean and lubricate the tension arm shaft with sewing machine oil, and reassemble by reversing the above steps.
6. Perform the tension pole position check and the back tension check (refer to sections 2.4.2 and 2.4.4).

2.3.13 Pick-up head

1. Unsolder the two wires from the terminals of the picl up head.
2. Take out screw ① and remove the pick-up head.
3. Replace and reassemble the pick-up head by reversir the above steps. Use care regarding the wire polarit Check that the pick-up head is toward the center portic of the drum shaft.
4. Perform the drum pulse level adjustment (refer to sectic 3.5.1).

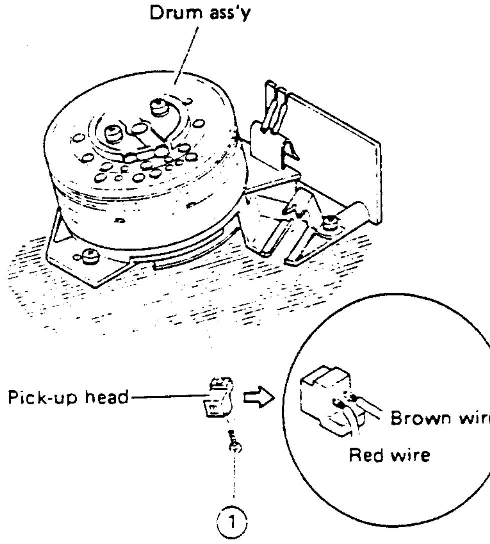


Fig. 2-3-17 Replacement of pick-up head

2.4 CHECKS AND ADJUSTMENTS

2.4.1 Mechanism timing check

- Loading rings and loading gear (2)

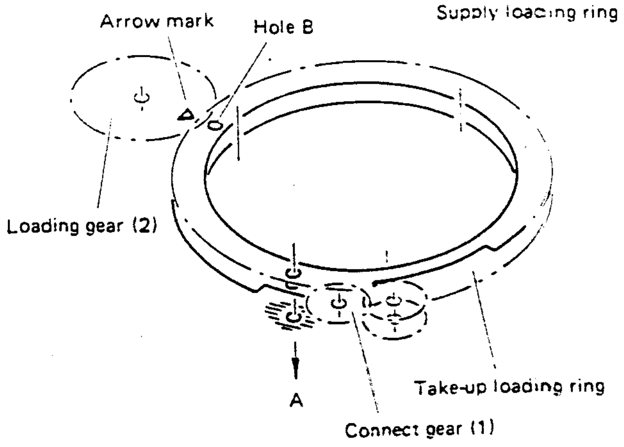

Arrow mark
Hole B
Supply loading ring
Loading gear (2)
A
Take-up loading ring
Connect gear (1)

Fig. 2-4-1 Loading ring loading gear (2)

1. Confirm that the two holes of supply and take-up loading rings are aligned with the hole of the main-deck (arrow A in Figure). If a discrepancy is noted, after removing the loading gear (2), adjust the loading rings to obtain the correct position.
2. At the same time, confirm that the arrow mark of the loading gear (2) corresponds with hole B of the supply loading ring. If a discrepancy is noted, remove and reinstall the loading gear (2) to obtain the correct position.

- Cam gear (drive gear bracket) and loading gear (1)

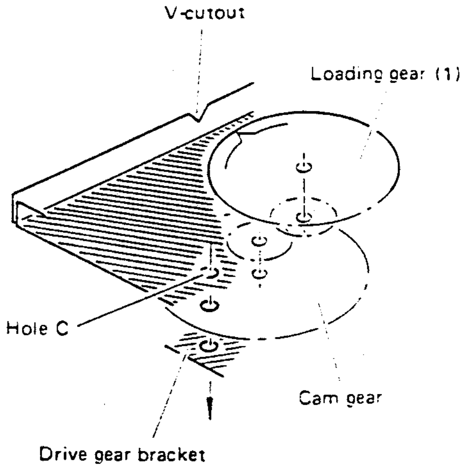

V-cutout
Loading gear (1)
Hole C
Cam gear
Drive gear bracket

Fig. 2-4-2 Cam gear/loading gear (1)

1. When the two holes of the cam gear and drive gear bracket are aligned with hole C of the main-deck, confirm that the arrow mark of loading gear (1) is aligned with the V-cutout portion of the main-deck. If a discrepancy is noted, remove and reinstall the loading gear (1) to obtain the correct position.

2.4.2 Tension pole position check

1. Without loading a tape, set for the Play mode (refer to section 2.3.1).
2. As indicated in Fig. 2-4-3, check that the center of the tension pole is aligned with the left edge of the base support of the guide pin.
3. If necessary, loosen screw ① and adjust the tension band holder to obtain the correct tension pole position.

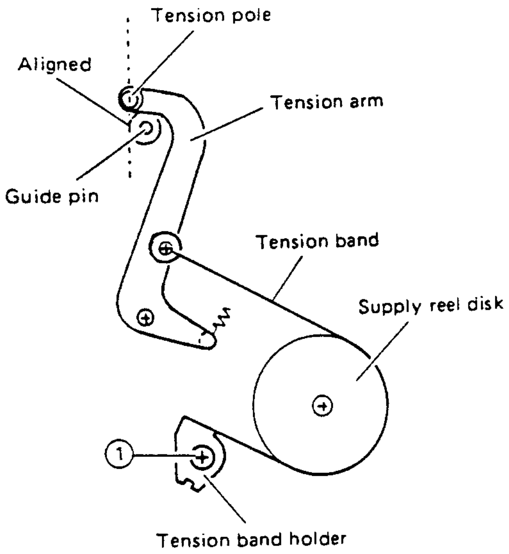

Tension pole
Aligned
Tension arm
Guide pin
Tension band
Supply reel disk
①
Tension band holder

Fig. 2-4-3 Tension pole position

2.4.3 Take-up torque check

1. Set the play (SP) mode without the cassette housing.
2. Set the torque gauge on the take-up reel disk.
3. Relax the grip on the torque gauge so that the indicator needle and scale rotate at equal speed, then read the indication. The correct value is between 60 and 100 gf-cm.
4. If not the correct value, install a new clutch mechanism (Refer to section 2.3.10).

2.4.4 Back tension check

1. Use the back tension cassette gauge and set for the Play (SP) mode.
2. Confirm that the indication is between 11 and 19.
3. If not the correct value, check the tension pole position (refer to section 2.4.2) and the condition of the spring between tension arm and main-deck.
4. If necessary, replace the tension band (refer to section 2.3.12).

2.4.5 Tape transport system checks and adjustments

The tape transport system has been precisely aligned at the factory and normally does not require readjustment. The following check is therefore necessary only in cases of severe usage or when replacing parts affecting the tape transport system.

- Tape transport checks

1. Use a 180-minute tape and check at the tape beginning and ending portion according to the following steps.

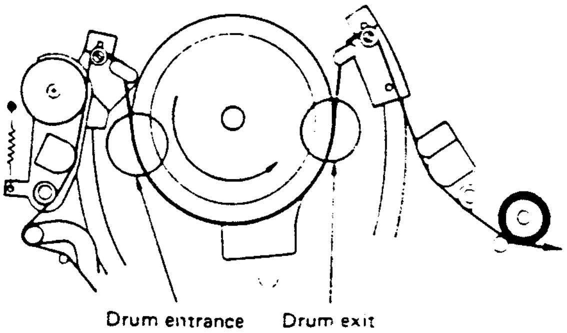
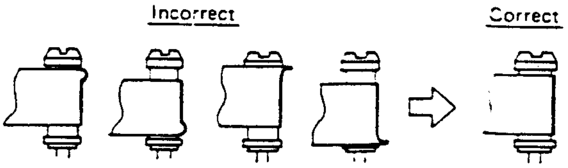
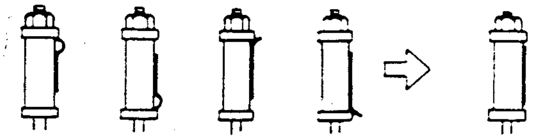


Fig. 2-4-4 Drum entrance/exit

1) During Play mode, observe tape at the entrance and exit portions of the drum lead.
Confirm that the tape slips neither upward nor downward with respect to the lead.



(a) Guide roller



(b) Guide pole

Fig. 2-4-5 Guide roller/guide pole

2) If defects are noted during the above check, perform the guide roller height adjustment.
3) During Play mode, observe the tape at the take-up and supply guide poles and guide rollers.
Confirm absence of curling, wrinkling, etc.
4) If defects are noted during the above check, perform the guide pole height adjustment.

2. At the ending portion of the recorded 180-minute tape, set for the Search Rev. (9 times speed) mode.
1) Confirm absence of curling, wrinkling, slippage, etc at the take-up guide pole.
2) In the same manner, during Slow Rev. (1/5 speed) mode, check at the take-up guide pole.
3) If defects are noted during the above checks, perform the reverse tape path adjustment.

3. Perform the interchangeability checks and adjustment (refer to section 2.4.6).

- Guide roller height adjustment

1. Slightly loosen the setscrew under the guide roller of the pole base.
2. Use a cassette tape and set for the Play mode.
3. With a slotted screwdriver, slightly turn the guide roller so that the tape travels smoothly in the drum lead without slipping upwards or downwards.

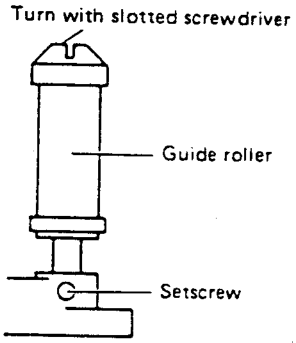


Fig. 2-4-6 Guide roller height adjustment

Notes:

1) Loosen the setscrew only enough to allow the guide roller to be turned.
If excessively loose, tape motion may turn the roller inadvertently.
2) Turn the roller carefully to avoid damage to the tape.

- Supply guide pole height adjustment

1. Remove the left bracket of the main-deck by taking out the two screws, set the height gauge on the maindeck.

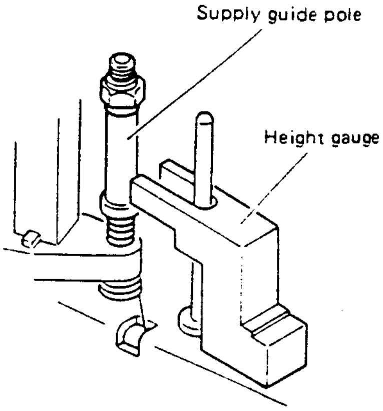


Fig. 2-4-7 Height of supply guide pole

2. Check the height of the upper face of the lower flange. If necessary, carefully adjust by turning the nut.
3. Use a cassette tape and set for the Play mode.

4. Use a metric nutdriver to turn the nut to align the tape lower edge with the upper face of the lower guide flange. However, this adjustment must be performed within ±0.5 mm (1 turn: 0.5 mm) of the height adjusted by the height gauge.
5. If there is a large discrepancy, check the height of the supply reel disk, tension pole and other mechanical components.

- Take-up guide pole height adjustment

1. Remove the LED holder by taking out the screw, set the height gauge on the main-deck.
2. Check the height of the upper face of the spacer. If necessary, carefully adjust by turning the nut.
3. Use a cassette tape and set for the Play mode.
4. Turn audio/control head screw ① and align the tape lower edge with the upper face of the lower guide flange.

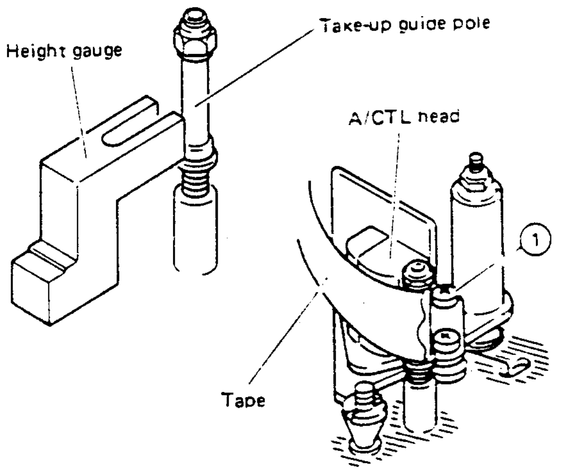

Height gauge
Take-up guide pole
A/CTL head
①
Tape

Fig. 2-4-8 Height of take-up guide pole

Note: Do not adjust the height of the take-up guide pole itself.

- Reel disk height check

1. Set the height gauge on the main-deck.

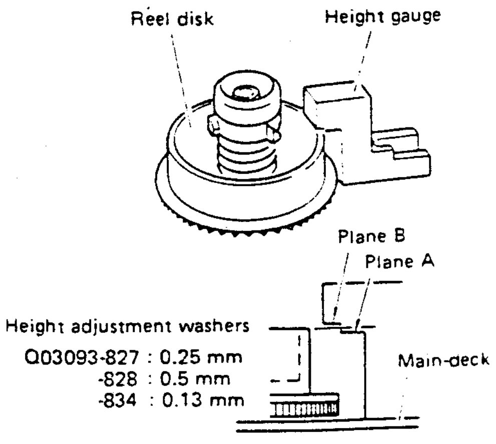

Reel disk
Height gauge
Plane B
Plane A
Height adjustment washers
Q03093-827 : 0.25 mm
-828 : 0.5 mm
-834 : 0.13 mm
Main-deck

Fig. 2-4-9 Height of reel disk

2. Check the reel disk height. The correct height is between planes A and B.
3. If not correct, use the height adjustment washers to obtain the correct height.

- Reverse tape path adjustment

1. At the ending portion of the recorded 180-minute tape, set for the Search Rev. (9 times speed) mode.
2. Adjust the setscrew of the guide arm for smooth tape transport at the take-up guide pole.

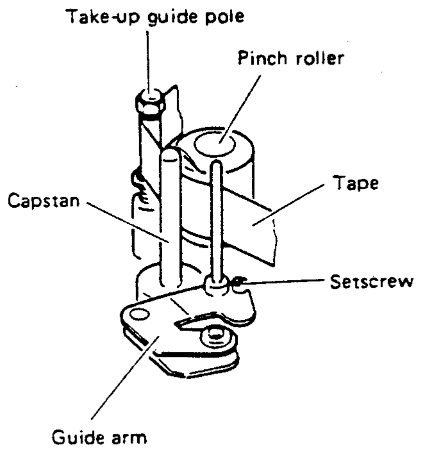

Take-up guide pole
Pinch roller
Capstan
Tape
Setscrew
Guide arm

Fig. 2-4-10 Reverse tape path

Note: Two or three seconds may elapse after adjusting the setscrew for the effect to appear at the take-up guide pole.

3. Set for the Slow Rev. (1/5 speed) mode and confirm absence of curling, wrinkling, etc.
4. If defects are noted, repeat the above steps 1 and 2.

2.4.6 Interchangeability checks and adjustments

Before using an alignment tape, use a regular tape and confirm correct tape transport operation.

- Preliminary checks and adjustments

1. Connect an oscilloscope to TP-6 (FM OUT) of the VIDEO board. Trigger the oscilloscope externally with the signal from TP-11 (DRUM F.F.) of the VIDEO board.
2. Play the alignment tape (stairstep signal) MH-2.

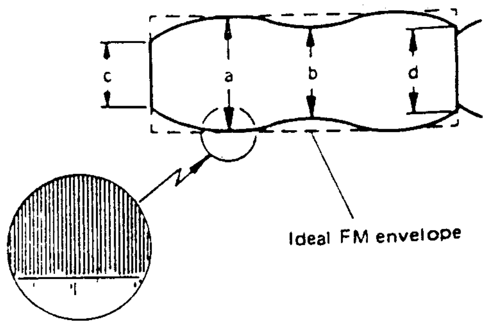

c
a
b
d
Ideal FM envelope

Fig. 2-4-11 FM waveform (max. output)

1) Turn the TRACKING knob to obtain the maximum FM output.
Observe the FM waveform, read the maximum level (a) and the minimum levels (b), (c) and (d). Confirm that:

$$\frac{b}{a} \geq 0.7,\ \frac{c}{a} \geq 0.5 \text{ and } \frac{d}{a} \geq 0.5$$

Note: If the waveform is serrated, read the value at the most uniform serrations.

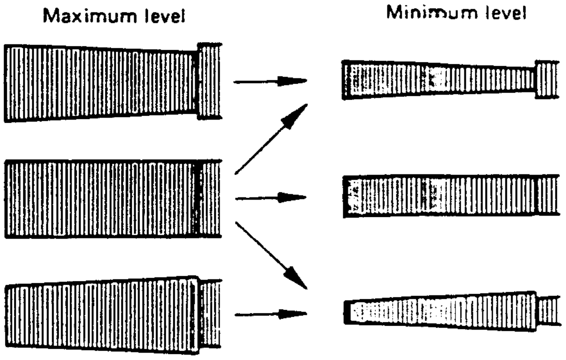


Fig. 2-4-12 Normal waveform examples

2) Turn the TRACKING knob to vary the FM output from maximum to minimum.
Confirm that the waveform variation is nearly parallel.

3) If the above checks yield normal results, proceed to the audio/control head adjustments.
If defects are noted, perform the following adjustments.

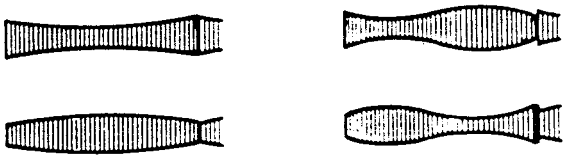


Fig. 2-4-13 Incorrect waveform examples

3. Loosen the setscrews of the supply and take-up guide rollers. If the guide rollers turn freely, slightly tighten the setscrews.

4. Play the alignment tape (atairstep signal) MH-2.

5. Observe oscilloscope display and adjust the TRACKING knob for maximum FM output.

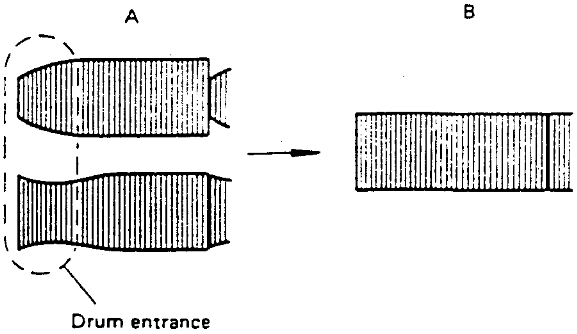


Fig. 2-4-14 Drum entrance adjustment

1) Refer to Figure. Examples of incorrect waveforms ar shown by A.
Use a slotted screwdriver to adjust the supply guid roller so that the rising portion (drum entrance) of th waveform becomes flat as shown by B.

2) In the same manner as for the drum entrance, turn th take-up guide roller to adjust the falling portion (drur exit) of the FM waveform.
Incorrect examples are shown by C in Figure, while [indicates the correct adjustment.

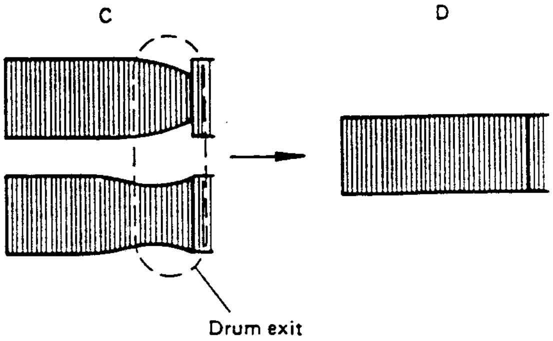


Fig. 2-4-15 Drum exit adjustment

3) In addition to observing the waveform, confirm absenc of tape slippage or curling at the supply and take-u guide poles.
If the tape separates from the guide or wrinkling occu at the supply guide pole, adjust the supply guide po height (refer to section 2.4.5).
If at the take-up guide pole, adjust by turning the audic control head screw (refer to section 2.4.5).

6. Observe the FM waveform and adjust the TRACKIN knob for minimum FM output level.

1) If the waveform becomes similar to A, B, C or D i Figure, carefully adjust the supply and take-up guic rollers so that the waveform becomes similar to E, or G.

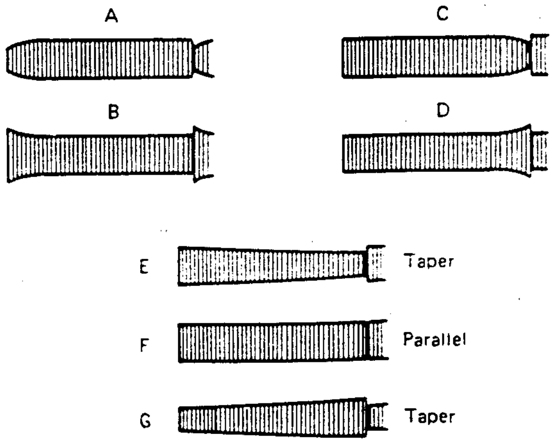


Fig. 2-4-16 Minimum FM waveform

Note: At this time, if the waveform fluctuates, adju for minimum fluctuation.

2) Vary the FM output level and perform fine adjustmer of the supply and take-up guide rollers.

- Audio/control head height and azimuth adjustments

Incorrect audio/control head height can impair audio signal-to-noise ratio when playing back a pre-recorded tape.

1. Connect CH-1 probe of the oscilloscope to the terminal (L. AUDIO OUT) and CH-2 probe to the terminal (R. AUDIO OUT) of the TERMINAL board.
2. Turn the AUDIO OUT MONITOR knob fully counterclockwise (NORMAL) and set the switch to STEREO.
3. Play 6 kHz segment (stairstep signal) of the alignment tape MH-2.

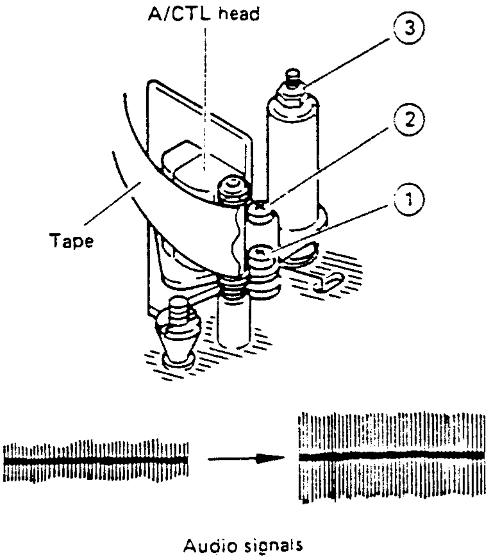


Fig. 2-4-17 Audio/Control head adjustment

1) Turn screw ① and screw ② to obtain two maximum audio outputs (CH-1 and CH-2). Adjust azimuth with screw ① and with screw ② so that small tape wrinkles are not produced at the take-up guide pole.
2) Turn nut ③ so that the two audio outputs become maximum.
3) Observe the audio waveforms and adjust screw ① so that the CH-1 waveform in phase with the CH-2 waveform.

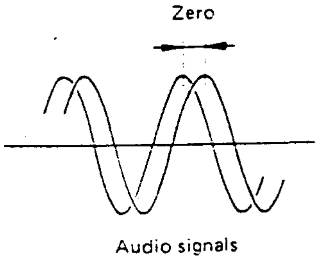


Fig. 2-4-18 Audio head phase adjustment

- Setscrew tightening

1. After confirming absence of tape wrinkling and other transport irregularities, tighten the setscrews while in the Stop mode.

   Note: Since the guide rollers are easily moved, use care when tightening.
2. Again perform the preliminary checks.

- Servo circuit adjustment

1. Perform P.B./REC switching point adjustment (refer to sections 3.5.4 and 3.5.5).
2. Perform tracking preset adjustment (refer to section 3.5.6 and 3.5.7).

- Control head phase adjustment

1. Connect an oscilloscope to TP-6 (FM OUT) of the VIDEO board. Trigger the oscilloscope externally with the signal from TP-11 (DRUM F.F.) of the VIDEO board.
2. Play the alignment tape (atairstep signal) MH-2.
3. Set the trigger to ⊕ slope and observe the CH-2 FM waveform.

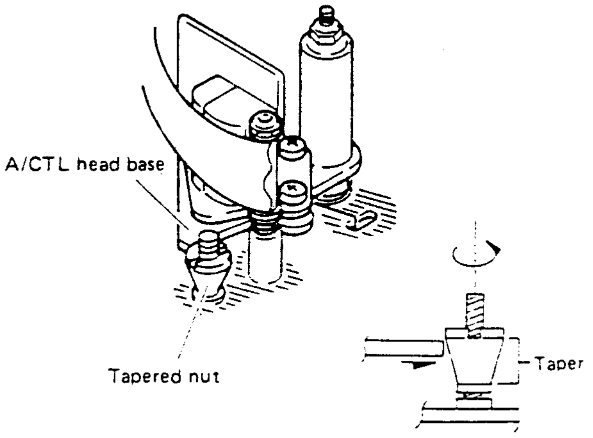


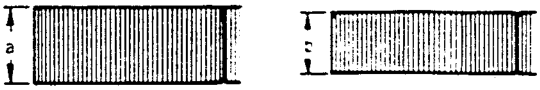
Fig. 2-4-19 Control head phase adjustment

1) Set the TRACKING knob to AUTO (center click position).
2) Turn the tapered nut clockwise so that the A/CTL head base comes into contact with the upper border of the taper portion of the tapered nut as shown in Figure.
3) Observe the FM output level and turn the tapered nut counterclockwise to obtain the first maximum FM output level.

- Final checks

1. Connect an oscilloscope to TP-6 (FM OUT) of the VIDEO board. Trigger the oscilloscope externally with the signal from TP-11 (DRUM F.F.) of the VIDEO board.
   1) Supply a video signal and perform recording, then playback. Confirm that the FM waveform also satisfies the specifications during playback of MH-2.
   (Both SP/LP modes.)
2. Connect CH-1 probe of the oscilloscope to TP-6 (FM OUT) of the VIDEO board and CH-2 probe to TP-3 of the FMA board.
   1) Play the alignment tape (stairstep signal of first segment) MH-F2.
   2) Set the trigger to ⊕ slope and observe the CH-2 video and audio FM waveforms.
   3) Turn the TRACKING knob to obtain the maximum video FM waveform.
   4) Observe the audio FM output and confirm that the level difference between this setting and the maximum level obtained manually is :

$$\frac{b}{a} \geqq 0.9$$



Maximum (Manually) (When maximizing VIDEO FM)

Fig. 2-4-20 Audio FM output level

   5) When the audio FM waveform is as shown in Fig. 2-4-11, confirm that:

$$\frac{b}{a} \geqq 0.8,\ \frac{c}{a} \geqq 0.6,\ \frac{d}{a} \geqq 0.6$$

Note: If the FM dropout is noted, perform the FM audio switching point adjustment (refer to section 3.8.1) before confirmation.

   6) Without an audio signal, perform recording in the SP mode, then playback. Confirm the audio FM waveform satisfies the specifications during playback of alignment tape MH-F2.
3. Perform overall checks and adjustments of the servo circuit (refer to section 3.5) and video circuit (refer to section 3.6).
4. Perform the audio circuit adjustment (refer to section 3.7).

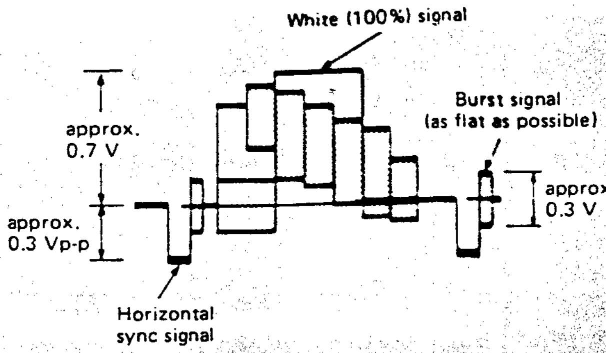
SECTION 3
ELECTRICAL ADJUSTMENTS

3.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts.
It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

3.2 REQUIRED TEST EQUIPMENT AND JIGS

1. Color television or monitor
2. Oscilloscope: wide-band, dual-trace, triggered delayed sweep
3. Frequency counter
4. Audio oscillator
5. Audio voltmeter
6. Digital voltmeter
7. Signal generator: RF/IF sweep/marker
8. Signal generator: PAL color bar, stairstep


White (100%) signal
Burst signal
(as flat as possible)
approx.
0.7 V
approx.
0.3 V
approx.
0.3 Vp-p
Horizontal
sync signal

Color-bar signal of pattern generator

Fig. 3-2-1

9. Servo checker (79V29902)

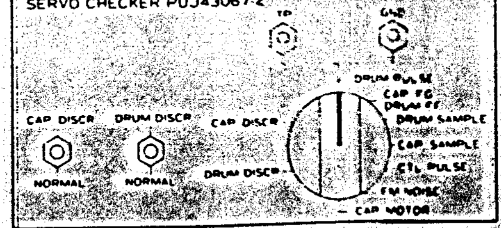
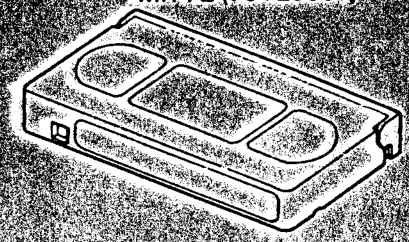
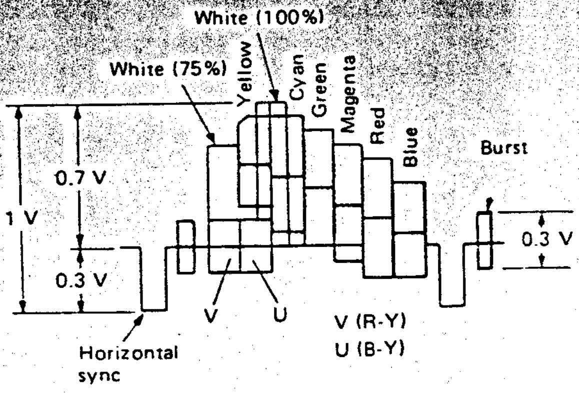

SERVO CHECKER PUJ43067-2
TP
GND
CAP DISCR
NORMAL
DRUM DISCR
NORMAL
CAP DISCR
DRUM DISCR
DRUM PULSE
CAP FG
DRUM FG
DRUM SAMPLE
CAP SAMPLE
CTL PULSE
FM NOISE
CAP MOTOR

Fig. 3-2-2

10. Recording tape
11. Alignment tape: MH-2 (79V20196)
MH-F2 (79V29907)




White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
1 V
0.7 V
0.3 V
0.3 V
V
U
V (R-Y)
U (B-Y)
Horizontal
sync

Color bar signal waveform

(75%)

White	Yellow	Cyan	Green	Magenta	Red	Blue
V	U	White 100%			Black	

Color bar pattern

Fig. 3-2-3

SECTION 3
ELECTRICAL ADJUSTMENTS

3.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts.
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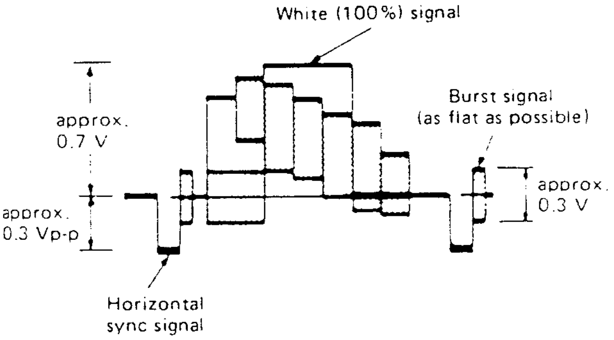
3.2 REQUIRED TEST EQUIPMENT AND JIGS

1. Color television or monitor
2. Oscilloscope: wide-band, dual-trace, triggered delayed sweep
3. Frequency counter
4. Audio oscillator
5. Audio voltmeter
6. Digital voltmeter
7. Signal generator: RF/IF sweep/marker
8. Signal generator: PAL color bar, stairstep


White (100%) signal
Burst signal (as flat as possible)
approx. 0.7 V
approx. 0.3 V
approx. 0.3 Vp-p
Horizontal sync signal

Color-bar signal of pattern generator

Fig. 3-2-1

9. Servo checker (79V29902)

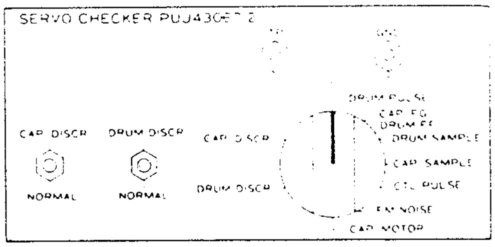
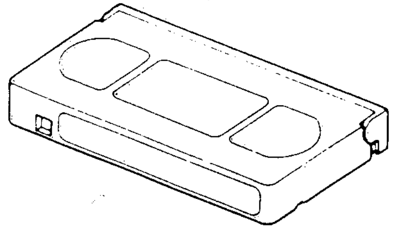
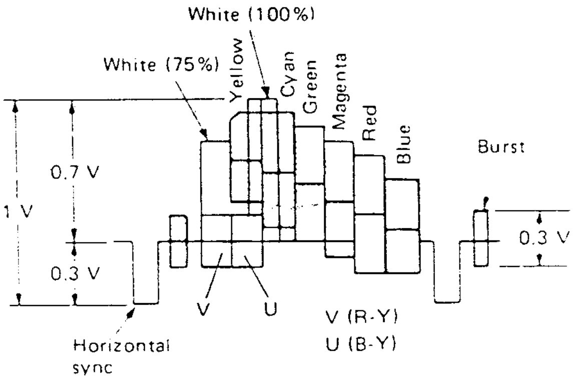

SERVO CHECKER PUJ4306-2
CAP DISCR
DRUM DISCR
NORMAL
NORMAL
CAP DISCR
DRUM DISCR
DRUM PULSE
CAP FG
DRUM FF
DRUM SAMPLE
CAP SAMPLE
CTL PULSE
FM NOISE
CAP MOTOR

Fig. 3-2-2

10. Recording tape
11. Alignment tape: MH-2 (79V20196)
    MH-F2 (79V29907)




White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
0.7 V
1 V
0.3 V
0.3 V
V
U
V (R-Y)
U (B-Y)
Horizontal sync

Color bar signal waveform

(75%)	White	Yellow	Cyan	Green	Magenta	Red	Blue
	V	U	White 100%			Black	

Color bar pattern

Fig. 3-2-3

3.2.1 JVC Alignment Tape Contents

1. MH-2 (Standard Play) contents

Segment	Playback Time	Video Signal	Audio Signal	Applications
1	10 minutes	Stairsteps	7 kHz	• Interchangeability checks and adjustments • Servo circuit checks and adjustments • Audio head azimuth adjustments
2	5 minutes	(none)	3 kHz	• Tape speed checks • Wow and flutter checks
3	10 minutes	Color bars	1 kHz	• Video signal playback circuit checks and adjustments • Audio signal playback circuit checks and adjustments
4	3 minutes	RF sweep	(none)	• Video head resonance adjustments • Markers: 2.0, 4.0, 5.0 MHz

Table 3-2-1

2. MH-F2 (FM Audio) contents

Note: Audio signal should be used for FM audio only.

Segment	Playback Time	Video Signal	Audio Signal	Applications
1	5 minutes	Stairsteps	Carrier only	• Interchangeability checks for video and audio
2	5 minutes	Stairsteps	1 kHz (±50kHz DEV.)	• FM audio signal playback circuit checks and adjustments

Table 3-2-2

3.3 REGULATOR CIRCUIT (02 REG board)

Note: Unless otherwise specified, test points and variable resistors are located on the Regulator board.

3.3.1 6 V DC Output Voltage

Mode : Playback
Digital Voltmeter : TP-26 of the VIDEO board

- Adjustment method

1. Adjust R17 for 5.2 ± 0.1 V.

3.3.2 12 V DC Output Voltage

Mode : Playback
Digital Voltmeter : TP-1

- Adjustment method

1. Adjust R12 for 12.5 ± 0.1 V.

3.4 MECHACON CIRCUIT (04 A/S/M board)

Note: Unless otherwise specified, test points and variable resistors are located on the A/S/M board.

3.4.1 Clock Frequency

Mode : E-E
Signal : No signal
Frequency Counter : Pin 23 of IC202

1. Confirm that the clock frequency becomes 3 MHz ± 0.1 MHz.

3.5 SERVO CIRCUIT (04 A/S/M board)

Notes:

1. Use the servo checker for checks and adjustments of the servo circuit.
2. Disconnect the AC plug before connecting the servo checker.
3. Unless otherwise specified, test points and variable resistors are located on the A/S/M board.

Preparation

- **Servo checker**

1. Connect the 10-pin plug of the checker to the 10-pin socket CN on the A/S/M board. Connect the ground of the checker to a chassis ground point.
2. Connect the oscilloscope probe to the TP and GND terminals of the servo checker. See Fig. 3-5-1. By using the selector switch, different waveforms can be observed.
3. Unless otherwise specified, set the CAP. DISCR. and DRUM DISCR. switches to the NORMAL positions.

SUPPLEMENT

1. When using an earlier SERVO CHECKER (79V29902), it can be modified as shown in Fig. 3-5-11.

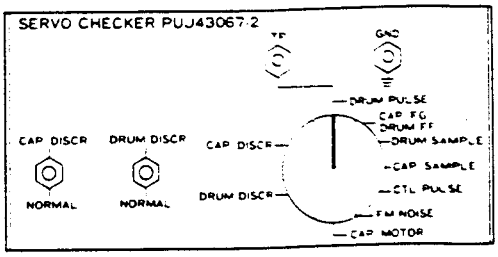

SERVO CHECKER PUJ43067-2
TP
GND
CAP DISCR
NORMAL
DRUM DISCR
NORMAL
CAP DISCR
DRUM DISCR
DRUM PULSE
CAP FG
DRUM FF
DRUM SAMPLE
CAP SAMPLE
CTL PULSE
FM NOISE
CAP MOTOR

Fig. 3-5-1 Servo checker

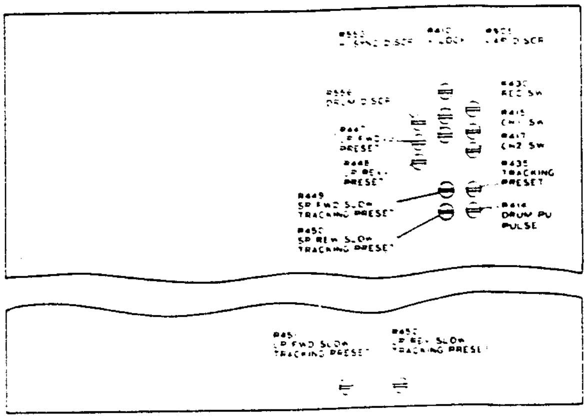

CAP DISCR
R556
DRUM DISCR
R430
REC SW
R415
CH1 SW
R417
CH2 SW
R448
PRESET
R435
TRACKING
PRESET
R449
SP FWD SLOW
TRACKING PRESET
R450
SP REW SLOW
TRACKING PRESET
R414
DRUM PU
PULSE
LP FWD SLOW
TRACKING PRESET
LP REV SLOW
TRACKING PRESET

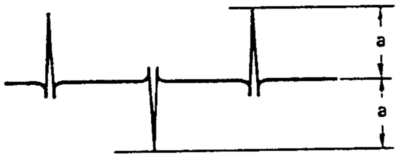
Fig. 3-5-2 Adjustment locations

3.5.1 Drum Pulse Level

Mode : REC (SP mode)
Signal : Color bar
REC Select SW : AUX
Trigger of Oscilloscope : Internal
Selector SW of Servo Checker : DRUM PULSE (TP-406)

- Adjustment method

1. Adjust R414 so that the positive and negative pulses are greater than 0.7 V as shown in Fig. 3-5-3.



a ≧ 0.7 ± 0.1 Vp-p

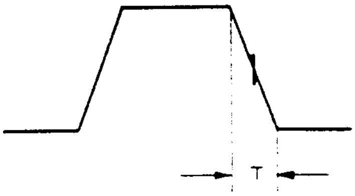
Fig. 3-5-3

3.5.2 Drum DISCR. Position

Mode : REC (SP mode)
Signal : Color bar
REC Select SW : AUX
Trigger of Oscilloscope : Internal
Selector SW of Servo Checker : DRUM SAMPLE (TP-407)

- Adjustment method

1. Set the DRUM DISCR. switch of the servo checker to the DRUM DISCR. position.
2. Adjust R556 to stabilize the sampling pulse with respect to the trapezoid as shown in Fig. 3-5-4. At this time, a side-ways drift at the rate of less than 40 ms in 5 seconds is acceptable.
3. Set the checker DRUM DISCR. switch to NORMAL and confirm a stable sampling pulse positioned at the center of the ramp.



T = 5 to 7 ms

Fig. 3-5-4

3.5.3 Capstan DISCR. Position

Mode	REC (SP mode)	REC (LP mode)
Signal	Color bar	Color bar
REC Select SW	AUX	AUX
Select SW of Servo Checker	CAP. SAMPLE (TP-403)	
Trigger of Oscilloscope	Internal	

Table 3-5-1

REC SP mode

- Adjustment method

1. Set the CAP. DISCR. switch of the servo checker to the CAP. DISCR. position.
2. Adjust R505 to stabilize the sampling pulse with respect to the trapezoid as shown in Fig. 3-5-5.
3. Set the CAP. DISCR. switch to NORMAL and confirm a stable sampling pulse positioned at the center of the ramp.

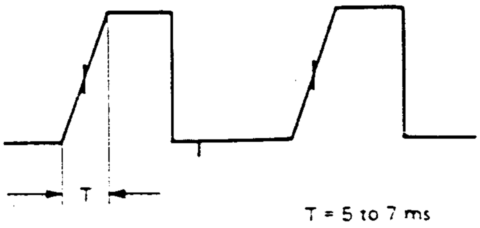


Fig. 3-5-5

REC LP mode

4. Confirm a stable sampling pulse positioned at the center of the ramp as shown in Fig. 3-5-5.

Note: At this time, a sideways drift at the rate of less than 40 ms in 5 seconds is acceptable.

3.5.4 PB Switching Point

Mode : PB (SP mode)
Signal : Alignment tape (MH-2 Stairsteps)
Oscilloscope : VIDEO OUT
Trigger of Oscilloscope : Set the selector switch of the servo checker to DRUM FF (TP-411).

- Adjustment method

1. Set trigger slope of the oscilloscope to minus (−).
2. Adjust R415 (CH-1 SW) to position the trigger point 6.5 ± 0.5 H before V. sync as shown in Fig. 3-5-6.

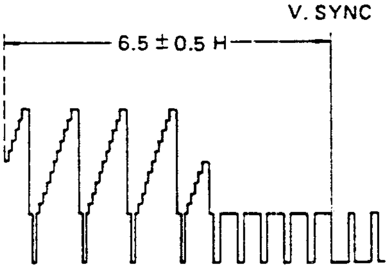


Fig. 3-5-6

3. Set trigger slope of the oscilloscope to plus (+).
4. Adjust R417 (CH-2 SW) to position the trigger point 6.5 ± 0.5 H before V. sync as shown in Fig. 3-5-7.

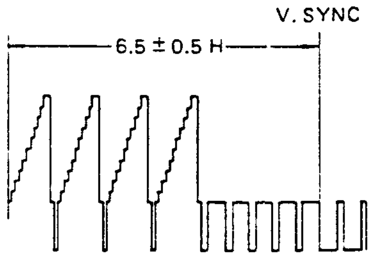


Fig. 3-5-7

3.5.5 REC Switching Point

Mode : REC (SP mode)
Signal : Stairsteps
Oscilloscope : VIDEO OUT
REC Select SW : AUX
Trigger of Oscilloscope : Set the selector switch of the servo checker to DRUM FF (TP-411).

- Adjustment method

1. Set trigger slope of the oscilloscope to minus (−).
2. Adjust R430 (REC SW) to position the trigger point 6.5 ± 0.5 H before V. sync as shown in Fig. 3-5-6.
3. After adjusting, disconnect servo checker.

3.5.6 Tracking Preset

Mode : REC then PB (SP mode)
Signal : Stairsteps
REC Select SW : AUX
Selector SW of
Servo Checker : CTL PULSE (TP-401)
Trigger of
Oscilloscope : TP-411 (A/S/M board)

- Adjustment method

1. Set the TRACKING (SLOW: R453, NORMAL: R438) control to the center click position.
2. Set trigger of the oscilloscope to minus (−).
3. Set for the REC mode and make a note of the TP-401 (REC CTL) waveform rise point.
4. Play back the recorded segment. Adjust R435 to align the rising point of the TP-401 (PB CTL) waveform with the REC CTL waveform rise point noted in step 3, and as shown in Fig. 3-5-8.

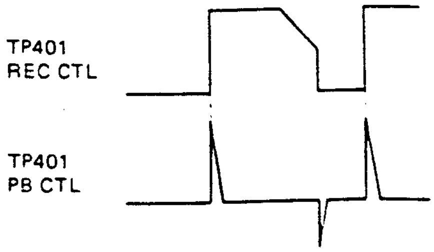


Fig. 3-5-8

3.5.7 Slow Tracking Preset

Note: Record a color bar signal first in the SP mode and then in the LP mode.

Mode : FWD 1/5th speed
Signal : Color bar
REC Select SW : AUX

SP mode

- Adjustment method

1. Set the TRACKING (SLOW: R453, NORMAL: R438) control to the center click position.
2. Adjust R449 (SP PRESET) to minimize the bar noise on a monitor.
3. Confirm that the bar noise becomes in the lower 1/6th of the picture as shown in Fig. 3-5-9.
4. Set for the REV 1/5th speed in the playback mode. Adjust R450 (SP PRESET) to minimize the bar noise on a monitor. Confirm that the specified bar noises are obtained as shown in Fig. 3-5-9.

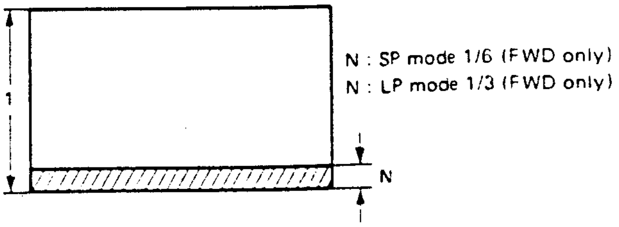


Fig. 3-5-9

LP mode

5. Set the TRACKING (SLOW: R453, NORMAL: R438) control to the center click position.
6. Adjust R452 (LP PRESET) to minimize the bar noise on a monitor.
7. Confirm that the bar noise becomes in the lower 1/3th of the picture.
8. Set for the REV 1/5th speed in the playback mode. Adjust R451 (LP PRESET) to minimize the bar noise on a monitor. Confirm that the specified bar noises are obtained as shown in Fig. 3-5-9.

3.5.8 V. Pulse

Mode : STILL (PLAY + PAUSE)
Signal : Alignment tape (MH-2 Color bar)
Oscilloscope : VIDEO OUT
Trigger of
Oscilloscope : TP-411

- Adjustment method

1. Observe the picture display and adjust R410 for minimum vertical jitter.
2. Confirm that the V. pulse width becomes 220 ± 30 µs.

3.5.9 H. Discriminator (Variable Search Playback mode)

Mode : PB, STILL (PLAY + PAUSE)
Signal : Alignment tape (MH-2 Color bar)
Oscilloscope : VIDEO OUT
Trigger of
Oscilloscope : Internal

Playback

- Adjustment method

1. Set for the Playback mode and make a note of the H. sync pulse as T µs as shown in Fig. 3-5-10.
2. Set for the Still mode and adjust R553 to obtain T' = T ± 0.3 µs as shown in Fig. 3-5-10.

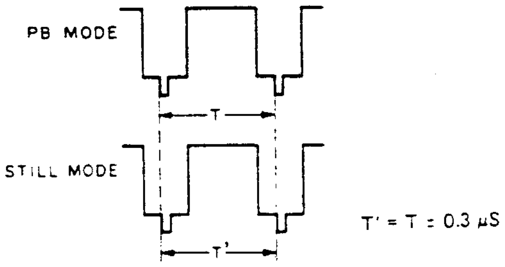


Fig. 3-5-10

3.5.10 Search Tracking

Note: Record a color bar signal in the LP mode.

Mode : REV x1 speed, FWD x3 speed
Signal : Color bar
REC Select SW : AUX

REV x1 speed

- Adjustment method

1. Set the TRACKING (SLOW: R453, NORMAL: R438) control to the center click position.
2. Adjust R448 (REV x1) to minimize the bar noise on a monitor.

FWD x3 speed

3. In the same manner as above and adjust R447 (FWD x3)

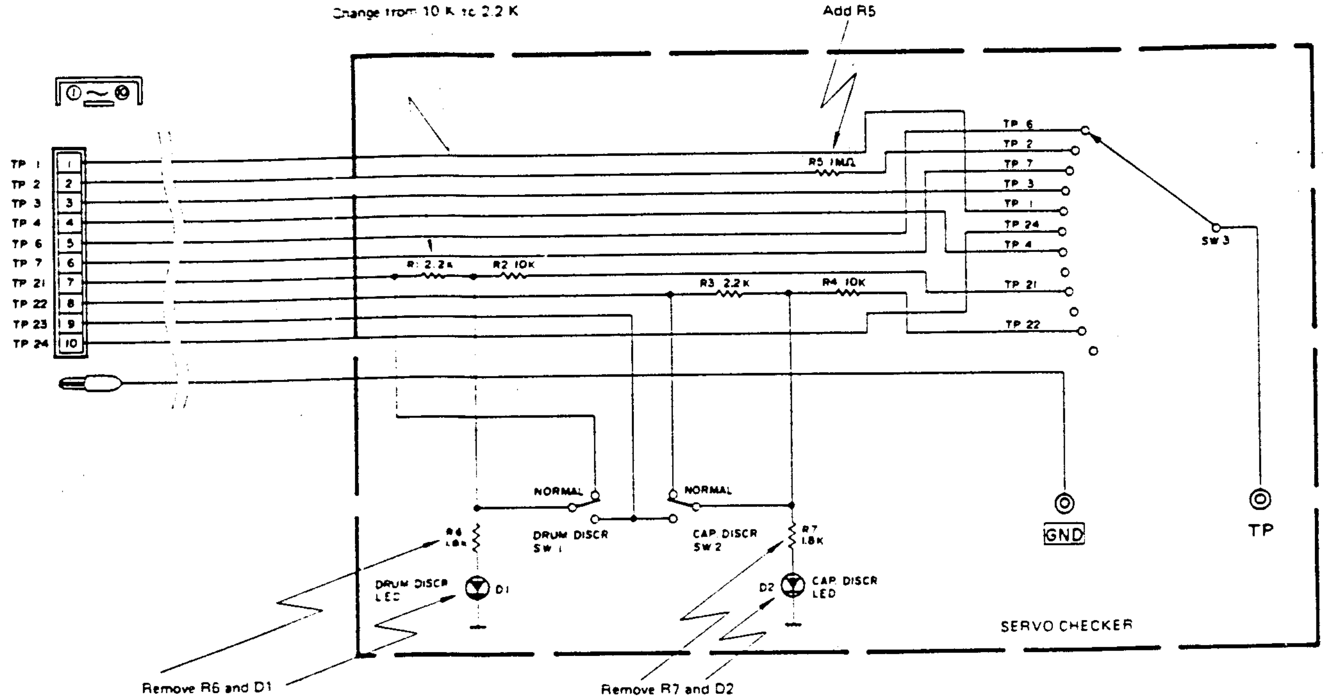

Change from 10 K to 2.2 K
Add R5
TP 1
TP 2
TP 3
TP 4
TP 6
TP 7
TP 21
TP 22
TP 23
TP 24
1
2
3
4
5
6
7
8
9
10
R5 1MΩ
R1 2.2K
R2 10K
R3 2.2K
R4 10K
TP 6
TP 2
TP 7
TP 3
TP 1
TP 24
TP 4
TP 21
TP 22
SW 3
NORMAL
NORMAL
R6 1.8K
DRUM DISCR SW 1
CAP DISCR SW 2
R7 1.8K
DRUM DISCR LED
D1
D2
CAP DISCR LED
GND
TP
SERVO CHECKER
Remove R6 and D1
Remove R7 and D2

Fig. 3-5-11

3.6 VIDEO CIRCUIT (0 3 VIDEO board)

Notes:

1. Unless otherwise specified, test points and variable resistors are located on the VIDEO board. Set the dynamic aperture switch (DYAC, SW1) to the OFF position.
2. Unless otherwise specified, the input signal is applied to the VIDEO IN.

3.6.1 (A) Video Head Resonance & Q (Quality Factor) (1 6 PREAMP board)

Notes:

1. Adjust both CH-1 and CH-2. The CH-2 is indicated by a rectangle ☐.
2. This adjustment is required only after replacing the upper drum (video heads).

Mode	:	PB (SP mode), PB (LP mode)
Signal	:	RF sweep
Oscilloscope	:	Pin 8 of IC3 (VIDEO board)

SP mode

- Adjustment method

1. Set for the playback mode without tape. (Refer to mechanical adjustment 2.3.1)
2. Connect a sweep generator to TP-1, TP-2 .
3. Adjust C32, C31 (RESON.) for 5.0 MHz peaking, and R8, R9 (Q) so that the ratio between 1 MHz and 5.0 MHz level becomes 1 : 2 as shown in Fig. 3-6-1.

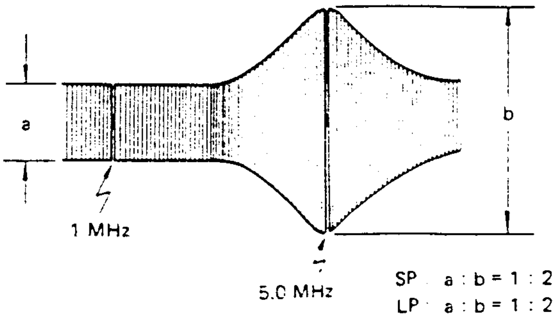


Fig. 3-6-1

LP mode

4. Perform adjustment in the same manner as SP mode CH-1, CH-2 . Connect a sweep generator TP-4, TP-3 .
5. Adjust resonance with C11, C12 and Q with R26, R25 .

(B) Video head resonance & Q (Quality factor) (1 6 PREAMP board)

Notes:

1. This adjustment is required only after replacing the upper drum (video heads).
2. Adjust both CH-1 and CH-2. The CH-2 is indicated by a rectangle ☐.
3. The MH-2, marker appears at 2 MHz, 4 MHz and 5 MHz, however, adjust for 5.0 MHz.

Mode	:	PB (SP mode), PB (LP mode)
Signal	:	Alignment tape (RF sweep, MH-2)
Oscilloscope	:	Pin 8 of IC3 (VIDEO board)
Trigger of Oscilloscope	:	TP-11 (0 3 VIDEO board)

SP mode

- Adjustment method

1. Set trigger of the oscilloscope to minus (−), plus (+) .
2. Turn R8 (CH-1 Q), R9 (CH-2 Q) fully counterclockwise as viewed from bottom.
3. Adjust C32, C31 to set the resonance point to 5.0 MHz as shown in Fig. 3-6-2.
4. If the levels of CH-1 and CH-2 differ, adjust the higher level channel to match the lower by using R8 and R9 .
5. Record a video signal; then play back and confirm absence of flicker and black-white reversal in the reproduced picture. If necessary, carefully readjust R8 and R9 .

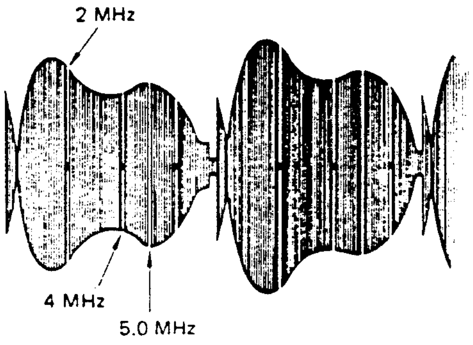


Fig. 3-6-2

LP mode

6. Connect 1 kΩ resistor between TP-24 and TP-27 of the VIDEO board.
7. Perform adjustment in the same manner as for the SP mode CH-1, CH-2 . Turn R26 fully counterclockwise and R25 fully clockwise as viewed from bottom. Adjust resonance with C11, C12 and Q with R26, R25 .
8. After adjusting, disconnect the resistor.

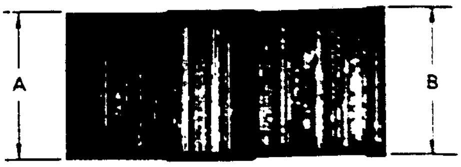
3.6.2 PB FM Channel Balance

Note: Adjust both SP mode and LP mode. The LP mode is indicated by a rectangle ☐.

Mode : REC then PB (SP mode, LP mode)
Signal : Color bar
Oscilloscope : TP-6 (VIDEO board)
Trigger of
Oscilloscope : TP-11 (03 VIDEO board)

- Adjustment method

1. Adjust R1, $\boxed{\text{R18}}$ of the PREAMP board to align the CH-1 and CH-2 levels as shown in Fig. 3-6-3.



A = B

Fig. 3-6-3

3.6.3 VXO (Variable Crystal Oscillator)

Mode : PB
Signal : Alignment tape (MH-2 Color bar)
Frequency Counter : TP-403

- Adjustment method

1. Adjust R461 to obtain 4.433619 MHz ± 50 Hz.

3.6.4 Video E-E Level

Mode : E-E
Signal : Color bar
Oscilloscope : VIDEO OUT or TP-10
REC Select SW : AUX
SP/EP SW : SP

- Adjustment method

1. With a 75 Ω load at VIDEO OUT, adjust R123 for 0.92 ± 0.03 Vp-p as shown in Fig. 3-6-4.

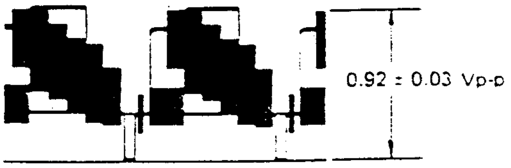


Fig. 3-6-4

3.6.5 Dynamic Aperture Control

Note: Dynamic aperture control adjustment (3.6.5) must be performed after completing video E-E level (3.6.4) and before starting carrier & deviation (3.6.6).

Mode : E-E
Signal : Color sweep
Oscilloscope : TP-25
REC Select SW : AUX
DYAC SW : OFF to ON
SP/EP SW : SP

- Adjustment method

1. With a 75 Ω load at VIDEO OUT, connect a sweep generator to VIDEO IN.
2. Use the control of the oscilloscope to position the 100 kHz region at graduation 2 of the oscilloscope scale. Set the DYAC SW to ON. Adjust R199 to position the 2 MHz portion at 2.1 to 2.2 of the oscilloscope graduations as shown in Fig. 3-6-5.

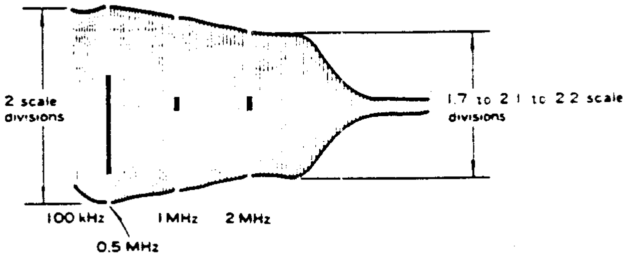


Fig. 3-6-5

3. After adjusting, set the DYAC SW to OFF.

3.6.6 Carrier and Deviation

IMPORTANT:

Ordinarily avoid performing this adjustment. It should be performed only if IC7 of the VIDEO board has been replaced or if significant waveform distortion and S/N deterioration occur during recording and playback due to deficient adjustment of the carrier set and deviation.

Note: Before adjustment, turn R100 (DARK CLIP) fully counterclockwise and R108 (WHITE CLIP) fully clockwise so that the signal is not limited.

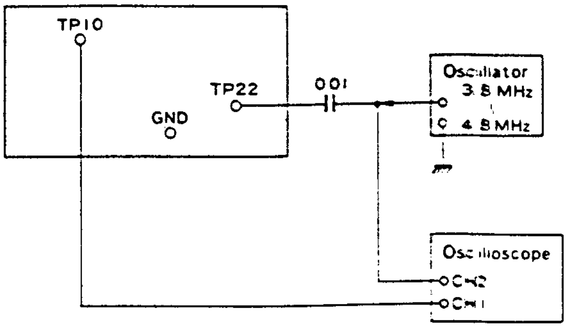


Fig. 3-6-6

Mode : E-E
Signal : Color bar
REC Select SW : AUX

- Adjustment method

1. Connect the equipment as shown in Fig. 3-6-6.
2. Set the oscilloscope to ADD mode and adjust the vertical gain of the oscilloscope and signal generator output to easily observe beat.
3. Set the signal generator for 3.8 MHz and adjust R102 (CARRIER) to set the carrier as shown in Fig. 3-6-7.
4. Set the signal generator for 4.8 MHz and adjust R105 (DEVIATION) to set the deviation as shown in Fig. 3-6-7.

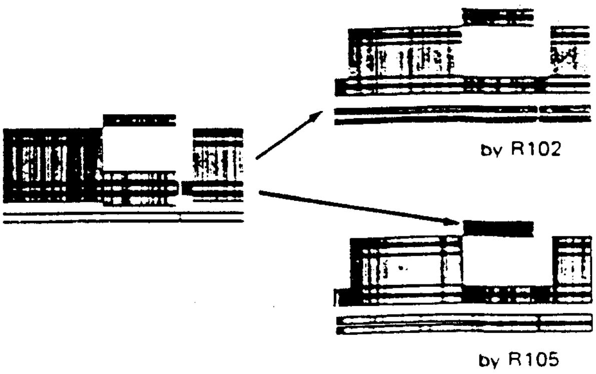


Fig. 3-6-7

3.6.7 White Clip and Dark Clip

Mode : E-E
Signal : Color bar
Oscilloscope : TP-3
REC Select SW : AUX
SP/LP SW : SP

- Adjustment method

1. With the rated signal level taken as 100%, adjust R108 (WHITE CLIP) so that the white peak overshoot becomes 88% to 92% as shown in Fig. 3-6-8.
2. In the same condition, adjust R100 (DARK CLIP) so that the sync tip undershoot becomes 43% to 47% as shown in Fig. 3-6-8.

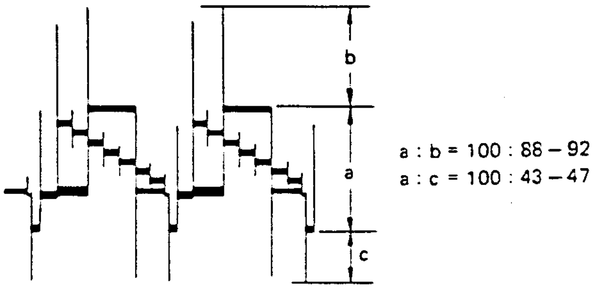


Fig. 3-6-8

3.6.8 AFC

Mode : E-E
Signal : Color bar
REC Select SW : AUX
Frequency Counter : TP-422
SP/LP SW : SP

- Adjustment method

1. Connect a jump wire between TP-421 and TP-423.
2. Adjust R465 to obtain 625 kHz ± 5 kHz.

3.6.9 Inverted Color Level

Mode : REC then PB (SP mode)
Signal : Color bar
REC Select SW : AUX
Oscilloscope : TP-405

- Adjustment method

1. Connect oscilloscope to TP-405 and observe signal level. Connect jump wires between TP429, TP-430 and GND. Again check the TP-405 level.
2. Adjust R523 (DELAYED COLOR LEVEL) to obtain the same level in both cases as shown in Fig. 3-6-9.

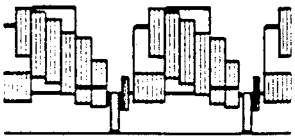


Fig. 3-6-9

3.6.10 0.5H Delayed Video Level

Note: Perform the 0.5H delayed video level (3.6.10) adjustment after completing delayed color level (3.6.9).

Mode : REC then PB (SP mode)
Signal : Color bar
REC Select SW : AUX
Oscilloscope : TP-426, TP-425

- Adjustment method

1. Connect one channel of a dual trace oscilloscope to TP-425 and the other channel to TP-426. Adjust R496 (0.5H DELAYED VIDEO ADJ) to obtain the same level in both cases as shown in Fig. 3-6-10.

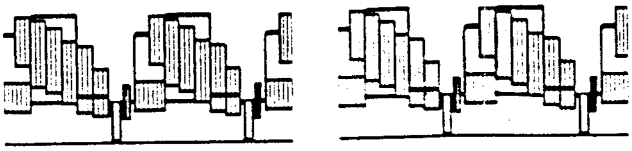

TP-425 TP-426

Fig. 3-6-10

3.6.11 APC Error Phase

Mode : REC then PB (SP mode)
Signal : Color bar
REC Select SW : AUX
Oscilloscope : TP-425, TP-428

- Adjustment method

1. Connect one channel of a dual trace oscilloscope to TP-425 and the other channel to TP-428 and observe the waveforms. Adjust L420 (7.8 kHz TUNING) to position the zero-cross 30 µ ± 3 µsec from the center of the burst signal as shown in Fig. 3-6-11.

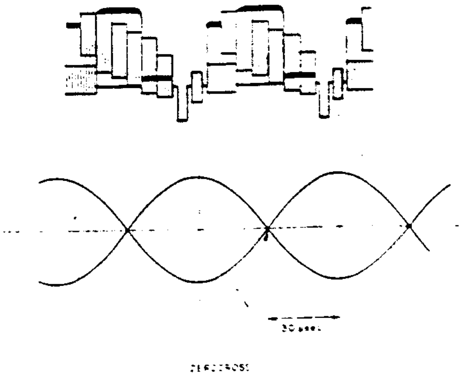


Fig. 3-6-11

3.6.12 0.5H Delayed Jump DET

Mode : E-E
Signal : No signal
REC Select SW : AUX
Frequency Counter: TP-432

- Adjustment method

1. Connect a jump wire between TP-427 and TP-431. Adjust R525 (0.5H DET) to obtain 30 kHz ± 0.2 kHz.

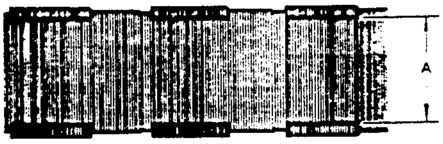
3.6.13 REC FM Level

Note: Perform the FM audio REC level (3.8.8) adjustment after completing the REC FM level (3.6.13) adjustment.

Mode : REC (LP mode)
Signal : Color bar
Oscilloscope : TP-4
REC Select SW : AUX

- Adjustment method

1. Adjust R82 (LP REC FM) so that the level of the FM waveform white component becomes 2.4 Vp-p as shown in Fig. 3-6-12.



A = 2.4 ± 0.1 Vp-p

Fig. 3-6-12

3.6.14 SP REC Color Level and Balance

Note: Perform the FM audio REC level (3.8.8) adjustment after completing SP REC color level & balance (3.6.14).

Mode : PB, REC then PB
Signal : Alignment tape (MH-2, color bar)
Oscilloscope : TP-404
REC Select SW : AUX
Trigger of Oscilloscope: TP-11

- Adjustment method

1. Play back a color bar segment of the MH-2 and observe color signal level. Adjust the Tracking control (R438) for maximum level of the color waveform and make a note of this as higher level of channel "A".
2. Record and play back a color bar signal. During recording, adjust R71 (SP REC COLOR) so that the higher level channel "B" becomes the same as "A" during playback as shown in Fig. 3-6-13.
   Note: Set the Tracking control (R438) to the center click position.
3. Confirm that the channel difference is within 3 dB.
   Note: Play back the alignment tape, then play back a self-recorded tape, confirm the absence of color level reversal between channels.

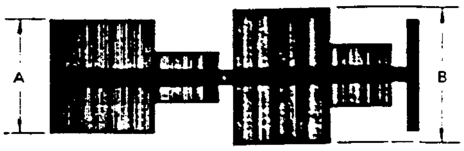


Fig. 3-6-13

3.6.15 LP REC Color Level and Balance

Note: Perform the FM audio REC level (3.8.8) adjustment after completing LP REC color level and balance (3.6.15).

Mode : PB, REC then PB
Signal : Alignment tape (MH-2, color bar)
Oscilloscope : TP-404
REC Select SW : AUX
Trigger of Oscilloscope: TP-11

- Adjustment method

1. Connect 220 Ω resistor between TP-24 and TP-27. Play back a color bar segment of the MH-2 and observe color signal level. Adjust the Tracking control (R438) for maximum level of the color waveform and make a note of this as higher level of channel "A".
2. Disconnect the resistor.
3. Record and play back a color bar signal. During recording, adjust R75 (LP REC COLOR) so that the higher level channel "B" becomes −2 dB ± 0.5 dB below "A" during playback as shown in Fig. 3-6-13.
   Note: Set the Tracking control (R438) to the center click position.
4. Confirm that the channel difference is within 3 dB.
   Note: Play back the alignment tape, then play back a self-recorded tape, confirm the absence of color level reversal between channels.

3.6.16 PB Y, Color Level

Mode : REC then PB (SP mode)
Signal : Color bar
Oscilloscope : VIDEO OUT or TP-10
REC Select SW : AUX

- Adjustment method

1. With a 75 Ω load at VIDEO OUT, adjust R135 for a luminance signal level of 0.92 ± 0.03 Vp-p.
2. Adjust R59 for a burst level of 0.27 ± 0.05 Vp-p as shown in Fig. 3-6-14.

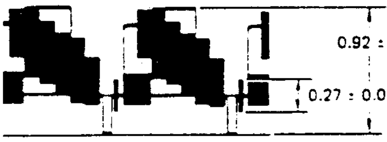


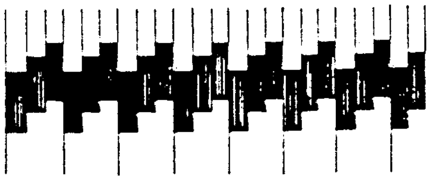
Fig. 3-6-14

3.6.17 NR Adj.

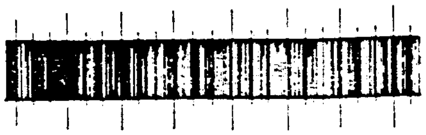
Mode : REC then PB (LP mode)
Signal : Stairsteps
Oscilloscope : TP-23
REC Select SW : AUX

- Adjustment method

1. Connect 0.022μF ceramic capasistor between TP-23 and GND. Adjust R140 to minimize the waveform as shown in Fig. 3-6-15.



INCORRECT



CORRECT

Fig. 3-6-15

3.6.18 Converter Balance

Mode : REC then PB (SP mode)
Signal : Color bar
Oscilloscope : TP-401
REC Select SW : AUX
Trigger of Oscilloscope: TP-11

- Adjustment method

1. Adjust R459 for minimum leakage of the 5.06 MHz component as shown in Fig. 3-6-16.

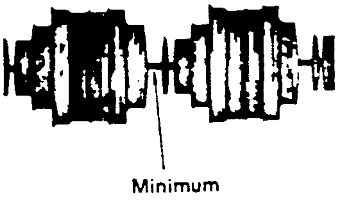


Fig. 3-6-16

3.6.19 Sharpness Preset

Mode : E-E
Signal : Color sweep
Oscilloscope : TP-21
REC Select SW : AUX

- Adjustment method

1. Set the SHARPNESS (R292) control to the center click position and connect a sweep generator to VIDEO IN.
2. Use the control of the oscilloscope to position the 100 kHz region at graduation 3 of the oscilloscope scale. Adjust R43 (SHARPNESS PRESET) to position the 2 MHz portion at 2.53 to 2.83 of the oscilloscope divisions as shown in Fig. 3-6-17.

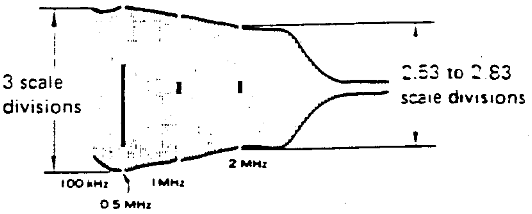


Fig. 3-6-17

3.6.20 REC FM EQ

Mode : REC then PB (SP mode)
Signal : Color sweep
Oscilloscope : VIDEO OUT or TP-10
REC Select SW : AUX
Trigger of Oscilloscope: TP-11

- Adjustment method

1. Set the SHARPNESS control (R292) to the center click position.
2. Connect a sweep generator to VIDEO IN and use the control of the oscilloscope to position the 100 kHz region at graduation 5 of the oscilloscope scale. Adjust R29 to position the 2 MHz portion at 2.75 to 3.34 of the oscilloscope graduations as shown in Fig. 3-6-18.
3. Confirm that the channel difference is within 1.5 dB.
4. If the above conditions are not fulfilled, adjust the higher level channel to match the lower by using R8 and R9 of the PRE AMP board.

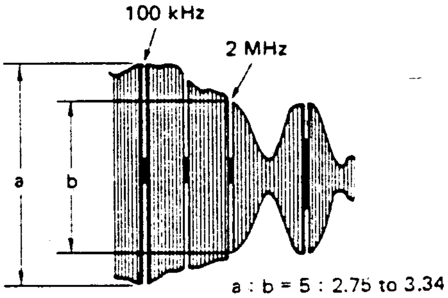


Fig. 3-6-18

3.6.21 Secam AMP & DET

Mode : E-E
Signal : Secam color bar
ERC select SW : AUX
Oscilloscope : TP410

- Adjustment method

1. Adjust R437 (SECAM DET) to obtain 8 Vp-p. Adjust L407 (1/2 FH TUNING) so that the transition step becomes at the center of (A) and (B) as shown in Fig. 3-6-19.

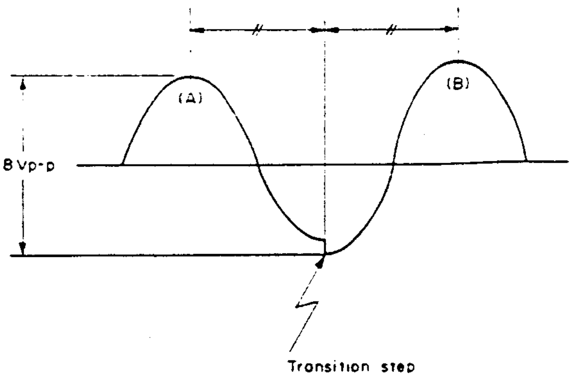


Fig. 3-6-19

3.7 AUDIO CIRCUIT

Notes:

1. Adjust both CH-1 and CH-2. The CH-2 is indicated by a rectangle☐.
2. Unless otherwise specified, test points and variable resistors are located on the A/S/M board.

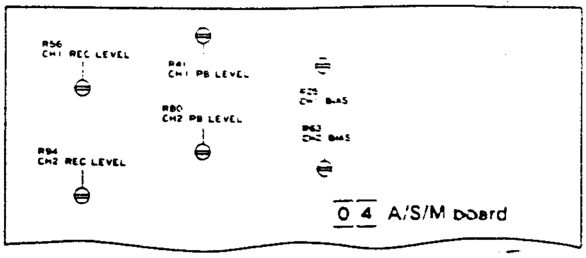


Fig. 3-7-1

3.7.1 Audio PB Level (0 4 A/S/M board)

Mode : PB
Signal : Alignment tape (MH-2, 1 kHz)
Oscilloscope : MIXING AUDIO OUT CH-1(L), CH-2(R)
AUDIO OUT
Monitor SW: L/R
NR SW : OFF

- Adjustment method

1. Set the AUDIO OUT MONITOR (R150) control to the NORMAL position.
2. Adjust R41, R80 of the A/S/M board for –8 dB ± 1 dBs (0.78 to 0.98 Vp-p) at AUDIO MIX OUT, CH-1(L), CH-2(R) as shown in Fig. 3-7-2.

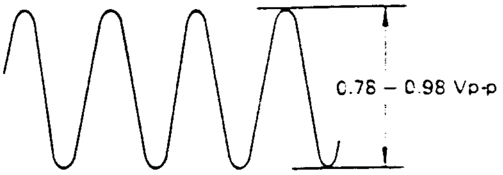


Fig. 3-7-2

3.7.2 Audio Bias Level (0 4 A/S/M board)

Mode : REC (LP mode)
Signal : No signal
Digital Voltmeter : Both sides of R1, R2 of the A/C HEAD board
REC Select SW : SC

- Adjustment method

1. Adjust R25, R63 of the A/S/M board for 2.4 ± 0.1 mV.
2. Confirm that the bias level becomes 2.7 ± 0.2 mV during recording with SP mode.

3.7.3 REC Level (0 4 A/S/M board)

Mode : REC then PB (SP mode)
Signal (RCA) : 1 kHz, –20 dBs,
: VIDEO : Color bar
Oscilloscope : MIXING AUDIO OUT CH-1 (L), CH-2(R)
AUDIO OUT
Monitor SW : L/R
NR SW : OFF
REC Select SW : SC

- Adjustment method

1. Set the AUDIO OUT MONITOR (R150) control to the NORMAL position.
2. Adjust R56, R94 before recording so that the level becomes –6 ± 1 dBs (0.98 to 1.23 Vp-p) when playback.

3.7.4 REC/PB Frequency Response (0 4 A/S/M board)

Mode : REC then PB (SP mode, LP mode)
Signal : 1 kHz, 100 Hz, 10 kHz, –18 dBs (SP mode),
: VIDEO: Color bar
: 1 kHz, 100 Hz, 5 kHz, –18 dBs (LP mode),
: VIDEO OUT: Color bar
Oscilloscope : MIXING AUDIO OUT CH-1(L), CH-2(R)
NR SW : ON
AUDIO OUT
Monitor SW : L/R
REC Select SW : SC

SP mode

- Adjustment method

1. Set the 1 kHz level for 0 dB reference signal and confirm frequency response as shown in Fig. 3-7-3.

LP mode

2. In the same manner as SP mode, confirm the frequency response (Fig. 3-7-4).
3. If the above conditions are not fulfilled, adjust R25 (CH-1 BIAS), R63 (CH-2 BIAS) of the A/S/M board to obtain 2.3 to 3.1 mV in the SP mode and 2.1 to 2.9 mV in the LP mode.

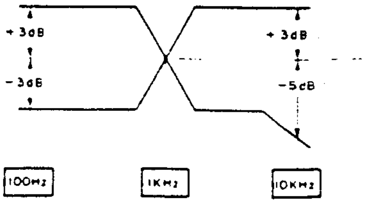


Fig. 3-7-3

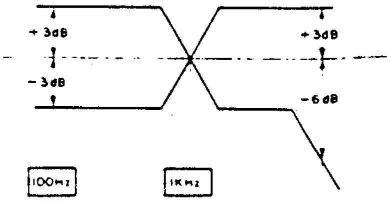


Fig. 3-7-4

3.8 FM AUDIO CIRCUIT

Notes:

1. Adjust both CH-1 and CH-2. The CH-2 is indicated by a rectangle ▭.
2. Unless otherwise specified, test points and variable resistors are located on the FMA board.

3.8.1 FM Audio Switching Point (0 5 FMA board)

Mode : REC then PB (SP mode)
Signal : No signal,
: VIDEO: Color bar
REC Select SW : SC

Trigger of Oscilloscope : TP-11 (VIDEO board)
Oscilloscope : TP-3 (Vertical: 100 mV/DIV.,
Horizontal: 1 ms/DIV.)

- Adjustment method

1. Set trigger of the oscilloscope to plus (+).
2. Turn R172 of the FMA board counterclockwise as viewed from the bottom to where the FM signal indicates absence. This becomes point (A) as shown in Fig. 3-8-1.
3. Turn R172 of the FMA board clockwise as viewed from the bottom to where the FM signal indicates absence. This becomes point (B) as shown in Fig. 3-8-1.
4. Adjust R172 so that the switching point position becomes at the center of (A) and (B) as shown in Fig. 3-8-1.

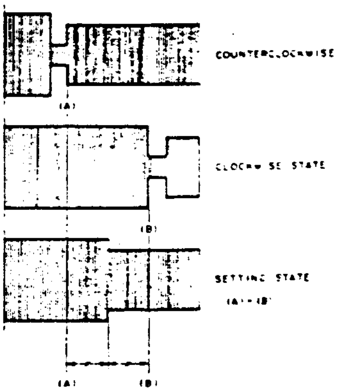


Fig. 3-8-1

5. Set trigger of the oscilloscope to minus (−).
6. In the same manner as above steps 2 to 4, adjust R175.

3.8.2 FM PB Level (0 5 FMA [FM AUDIO] board)

Mode : PB
Signal : Alignment tape (1 kHz ± 50 kHz deviation), MH-F2
Oscilloscope: MIXING AUDIO OUT CH-1(L), CH-2(R)
NR SW : OFF

- Adjustment method

1. Set the AUDIO OUT MONITOR (R150) control to the Hi-Fi position.
2. Adjust R126 (CH-1 PB LEV, R154 (CH-2 PB LEV) of the FMA board for −6 ± 0.5 dBs (1.04 to 1.17 Vp-p).

3.8.3 Indicator Level (0 5 FMA board)

Mode : E-E
Signal (RCA) : 1 kHz at −20 dBs
Audio Limiter SW: OFF
REC Select SW : SC

- Adjustment method

1. Set the AUDIO OUT MONITOR (R150) control to the NORMAL position.
2. Adjust HIFI REC level control to obtain −6 dBs (1.1 Vp-p) at AUDIO MIX OUT (L,R).
3. Adjust R77 (CH-1 LEV ADJ), R76 (CH-2 LEV ADJ) to illuminate green LED (1 to 8) indication on the level meter as shown in Fig. 3-8-2.

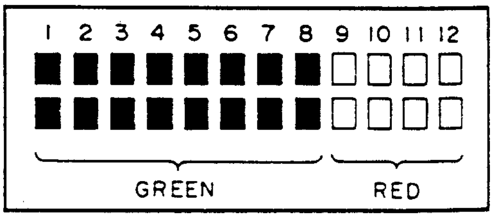


Fig. 3-8-2

3.8.4 E-E Level (0 5 FMA Board)

Mode : E-E
Signal (RCA) : 1 kHz at −20 dBs
Oscilloscope : MIXING AUDIO OUT CH-1 (L), CH-2 (R)
AUDIO OUT Monitor SW : L/R
REC Select SW : SC
NR : OFF

- Adjustment method

1. Set the AUDIO OUT MONITOR (R150) control to the NORMAL position.
2. Adjust R24 (CH-1 E-E), R25 (CH-2 E-E) of the FMA board for −6 ± 0.5 dBs (1.04 to 1.17 Vp-p).

3.8.5 FM Audio E-E Level (0 5 FMA Board)

Mode : E-E
Signal (RCA) : 1 kHz at −20 dBs
Oscilloscope : AUDIO MIX OUT CH-1 (L), CH-2 (R)
Audio Limiter SW: ON
REC Select SW : SC

- Adjustment method

1. Set the AUDIO OUT MONITOR (R150) control to the Hi-Fi position.
2. Adjust R30 (CH-1 FMA E-E), R31 (CH-2 FMA E-E) of the FMA board for −6 ± 0.5 dBs (1.04 to 1.17 Vp-p).

3.8.6 FM Carrier Frequency (0 5 FMA Board)

Mode : REC
Signal : No signal
Frequency Counter: CH-1: TP-9 (1.4 MHz),
CH-2: TP-10 (1.8 MHz)
REC Select SW : SC

- Adjustment method

1. Adjust R114 (CH-1 CARRIER ADJ) of the FMA board for 1.4 MHz ± 5 kHz.
2. Adjust R143 (CH-2 CARRIER ADJ) of the FMA board for 1.8 MHz ± 5 kHz.

3.8.7 FM Signal REC Level (0 5 FMA Board)

Mode : REC then PB (SP mode)
Signal (RCA) : 1 kHz at −20 dBs, VIDEO : Color bar
Oscilloscope : MIXING AUDIO OUT CH-1 (L),
CH-2 (R)
AUDIO OUT
Monitor SW : L/R
REC Select SW : SC

- Adjustment method

1. Set the AUDIO OUT MONITOR (R150) control to the Hi-Fi position.
2. Adjust R108 (CH-1 REC DEV.), R137 (CH-2 REC DEV.) of the FMA board before recording so that the level becomes −6 ± 1 dBs (0.98 to 1.23 Vp-p) when playback.

3.8.8 FM Audio REC Level (0 5 FMA Board)

Note: Perform the following steps only after completing item 3.6.13 "REC FM Level", 3.6.14, 3.6.15 "SP/LP REC Color Level" & channel balance.

Mode : REC (SP mode)
Signal : No signal
Oscilloscope : TP-2 (FMA board),
V : 20 mV/DIV
H : 0.5 μs/DIV
REC Select SW : SC

- Adjustment method

1. Turn R117 (1.4 MHz REC LEV) and R146 (1.8 MHz REC LEV) of the FMA board fully counterclockwise (↺) as viewed from bottom.
2. Referring to Fig. 3-8-3, gradually turn R117 (1.4 MHz REC LEV) (↻) of the FMA board clockwise to obtain 20 mVp-p of the 1.4 component.

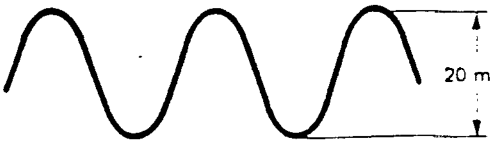


Fig. 3-8-3

3. Referring to Fig. 3-8-4, gradually turn R146 (1.8 MHz REC LEV) (↻) of the FMA board clockwise to obtain 60 mVp-p of the mixed waveforms (1.4 MHz and 1.8 MHz).

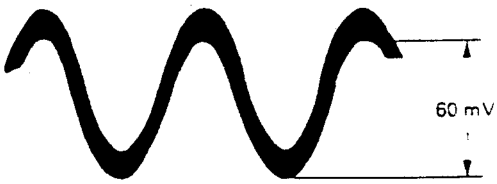


Fig. 3-8-4

3.9 TUNER/TIMER CIRCUIT
(0 9 TUNER/TIMER board)

3.9.1 Timer Control Clock

Mode : E-E
Signal : No signal
Frequency Counter: TP-1 (Tuner/Timer board)

- Adjustment method

1. Adjust C6 for 4.194304 MHz.

3.10 TUNER/IF CIRCUIT
(0 7 TUNER/IF board)

Note: Unless otherwise specified, test points and variable resistors are located on the TUNER/IF board.

- Equipment required

1. Oscilloscope
2. IF sweep signal generator with suitable markers (PIF, SIF, etc.)
3. DC power supply — For IF AGC bias (approx. 5 V variable)
4. Sweeper probe (sweep signal supply cable) as shown in Fig. 3-10-1.

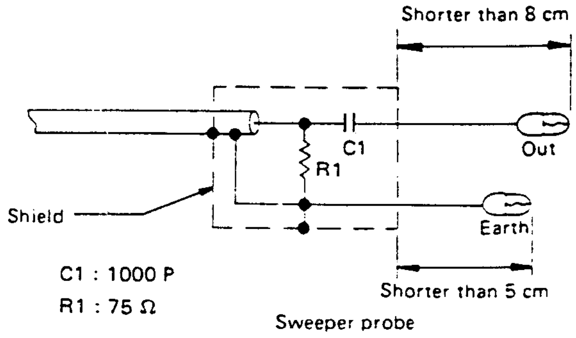


Fig. 3-10-1

3.10.1 LLD (Picture) Coil

IF Sweep Generator : Pin 9 of IC1
Oscilloscope : TP-12B

- Adjustment method

1. Set the IF sweep signal generator level so that amplitude of the signal becomes 25 mV rms. Connect a DC power supply to TP-14 (AGC) and adjust the DC power supply to obtain 1 Vp-p at TP-12B (VIDEO DET OUT).
2. Adjust T3 (LLD coil) so that the VIDEO marker 38.9 MHz

   becomes maximum level.

3.10.2 SOUND Trape Coil

IF Sweep Generator : Pin 9 of IC1
Oscilloscope : TP-12B

- Adjustment method

1. In the same condition as above item 3-10-1. Adjust T2 (SOUND TRAP COIL) so that the SOUND marker 33.4 MHz

   becomes minimum level.

3.10.3 Adjacent Trap (E/EB/EG only)

IF Sweep Generator (output less than 90 dBμ) : Test point in the Front end.
Oscilloscope : TP-12B

- Adjustment method

1. 32.4 MHz signal that is modulated at 400 Hz is supplied to test point in the Front end.
2. Adjust L3 (ADJACENT TRAP) so that the waveform level (TP-12B) becomes minimum when connecting between pins of T3 (LLD coil).

3.10.4 SAW Coil .

IF Sweep Generator : Test point in the Front end.
Oscilloscope : TP-12B

- Adjustment method

1. Connect a jump wire between pins of T3 (LLD coil). In the same condition as item 3.10.1. Adjust T1 (SAW coil) so that the 34.47 MHz

   becomes maximum level.

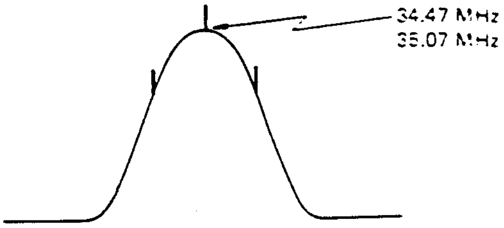


Fig. 3-10-2

3.10.5 IF Coil

IF Sweep Generator : Test point in the Front end.
Oscilloscope : TP-12B

- Adjustment method

1. Connect a jump wire between pins of T3 (LLD coil). In the same condition as item 3.10.1. Adjust IF coil in the Front end so that the 38.9 MHz

   becomes maximum level.

3.10.6 Multiplexer Coil (EB/EG only)

IF Sweep Generator : Test point in the Front end.
Oscilloscope : CN9 (IF OUT)

- Adjustment method

1. Connect a jump wire between pins of T3 (LLD COIL). In the same condition as item 3.10.1. Adjust T6 (multiplexer coil) so that the 37.4 MHz becomes minimum level.

3.10.7 AFC Coil

IF Sweep Generator : Test point in the Front end.
Oscilloscope : Pin 24 of IC1

- Adjustment method

1. Set the IF sweep signal generator level so that amplitude of the signal becomes 8.5 mV rms. Disconnect a jump wire from T3 (LLD coil) and set the AFC SW to ON.
2. Connect a DC power supply to TP-14 (AGC). Adjust the DC power supply to the point just before waveform (S curve) is saturated. At this time, adjust T4 (AFC coil) so that the 38.9 MHz

   level becomes 6.0 V as shown in Fig. 3-10-3.

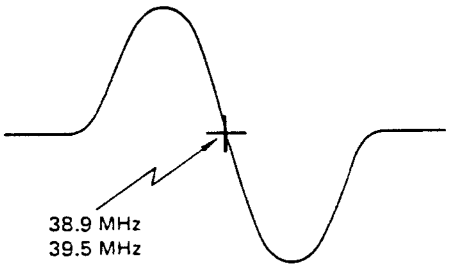


Fig. 3-10-3

3.10.8 RF AGC

Color Bar TV Channel Signal Generator (output 75 dBμ) : ANT IN of the Front end.
Oscilloscope : IF terminal of the Front end.

- Adjustment method

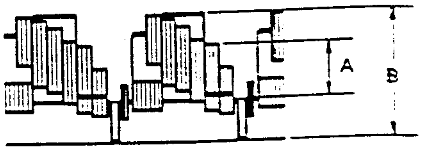
1. Supply a color bar signal on a VHF-HI channel 7. from a TV channel signal generator to ANT IN and select the channel corresponding to the generator.
2. First adjust R17 (RF AGC) for maximum output from the tuner IF terminal, then again adjust R17 (RF AGC) for −10 dB agin.

3.10.9 Color Level

Color Bar TV Channel
Signal Generator : ANT IN of the Front end.
(output 75 dBμ)
Oscilloscope : TP-12A (VIDEO OUT)

- Adjustment method ·

1. Supply a color bar signal on a VHF-HI channel 7. from a TV channel signal generator to ANT IN and select the channel corresponding to the generator.
2. With AFC SW ON, adjust R35 (color level) to satisfy as shown in Fig. 3-10-4.



A : B = 1 : 0.45

Fig. 3-10-4

3.11 DEMODULATOR CIRCUIT (EB/EG only)

($\boxed{2}\boxed{4}$ Demod. board)

Unless otherwise indicated, all test points and adjustments are located on the demodulator DEMOD board.

3.11.1 Equipment Required

1. Audio multiplex TV signal generator (See 3.11.12)
2. Sweeper-marker ("Swemar") generator (VIF and SIF)
3. Oscilloscope (dual-trace)
4. DC power supply (2 sets)

3.11.2 Low Level Detector and Matching Transformer

1. Remove the DEMOD. board from the set. Connect the puls (+) side of an 11.7 ± 0.05 V DC power supply to connector 31 (+12 V IN) and the minus (−) side to connector 34 (GND).
2. Connect the VIF output of a swemar generator to the IF IN terminal of the DEMOD. board.
3. Connect TP-803 to the FROM TP terminal of the swemar generator and the V SCOPE terminal of the generator to an oscilloscope.
4. Set the attenuation of the swemar generator to 40 dB (60 dBμ) and supply approximately 4 V DC to TP-802.
5. Turn T802 to align the waveform peak with the 38.9 MHz point. (See Fig. 3-11-1.)
6. Adjust T801 for maximum peak value at the 38.9 MHz point. (See Fig. 3-11-1.)

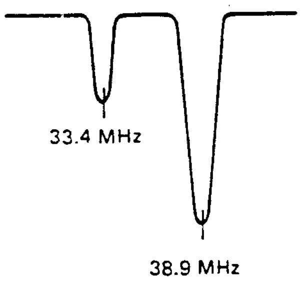


Fig. 3-11-1 IF tuning

3.11.3 "S" Curve

1. Ground TP-802 and connect the SIF output of the swemar generator to TP-803. Connect TP-804 to the FROM TP terminal of the generator and the V SCOPE terminal of the generator to the oscilloscope.

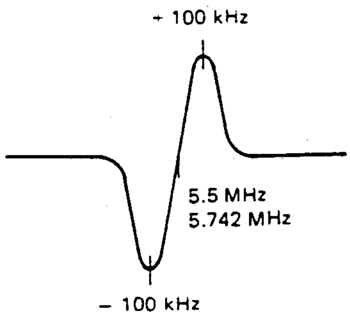


Fig. 3-11-2 S curve

2. Set the attenuation of the swemar generator to 40 dB (60 dBμ) and observe the waveform on the oscilloscope. Confirm adequate linearity at 5.5 MHz ± 30 kHz. (See Fig. 3-11-2.)
3. Similarly, connect TP-805 to the FROM TP terminal of the generator and confirm adequate linearity at 5.742 MHz ± 30 kHz. (See Fig. 3-11-2.)

3.11.4 De-emphasis

1. Disconnect equipment from TP-802 and TP-803.
2. Connect the IF output of the audio multiplex TV signal generator to the IF IN terminal of the DEMOD board. Supply a 97 dBμ IF input, video unmodulated 1 kHz audio signal at 100% modulation to both channels. Also supply a stereo mode pilot signal.
3. Connect a dual-trace oscilloscope to TP-819 and TP-821. Adjust R823 for minimum phase difference. (See Fig. 3-11-3.)

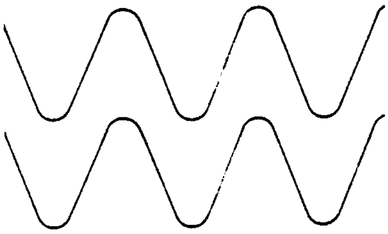


Fig. 3-11-3 De-emphasis

3.11.5 Stereo (L - R)

Connect oscilloscope to TP-806 and adjust R815 to minimize waveform peak-to-peak (p-p) value. At the optimum point, the frequency becomes 2 kHz at about 15 mVp-p. (See Fig. 3-11-4.)

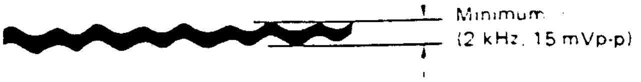


Fig. 3-11-4 Stereo

3.11.6 Pilot Carrier Level-1

Connect oscilloscope to pin 3 of IC805 and adjust T803 for maximum waveform peak-to-peak value. At this time, the pilot signal is the 54.7 kHz carrier with 50% modulation at 117.5 Hz. (See Fig. 3-11-5.)

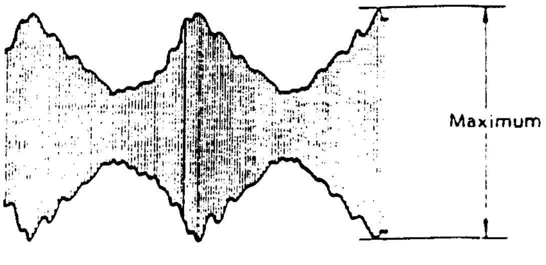


Fig. 3-11-5 Pilot carrier-1

3.11.7 Pilot Tank

Turn T804 for maximum waveform peak-to-peak value. (See Fig. 3-11-5.)

3.11.8 Pilot Carrier Level-2

1. Connect oscilloscope to TP-813 and adjust R838 for maximum waveform peak-to-peak value within the range of waveform stability. (See Fig. 3-11-6.)
2. Set the pilot signal for the 2-tone mode and confirm that the waveform is greater than 1 Vp-p. (See Fig. 3-11-6.)

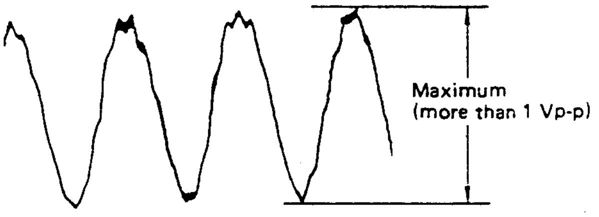


Fig. 3-11-6 Pilot carrier-2

3.11.9 Stereo Separation

1. Set the pilot signal for the stereo mode. With the L channel unmodulated, provide 1 kHz 100% modulation on the R channel.
2. Connect oscilloscope to TP-818 and adjust R836 for minimum waveform peak-to-peak value. At this time, confirm value of less than 80 mVp-p. (See Fig. 3-11-7.)
3. With the R channel unmodulated, provide 1 kHz 100% modulation on the L channel.
4. Connect an oscilloscope to TP-817 and check for less than 80 mVp-p. If more than this value, again adjust R836. (See Fig. 3-11-7.)

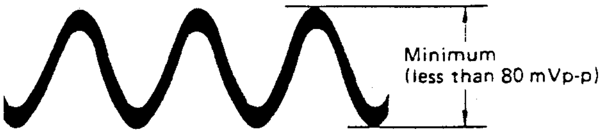


Fig. 3-11-7 Stereo separation

5. Repeat the adjustments to obtain equal waveform levels at TP-818 and TP-817, while maintaining less than 80 mVp-p. At this point, if still out of specification, repeat the adjustments of the foregoing sequences 4, 5 and 9.

3.11.10 LLD Buzz

1. Set the pilot signal for the 2-tone mode and supply a PAL crosshatch (87.5% modulation) signal without audio modulation.
2. Connect a dual-trace oscilloscope to TP-817 and TP-818. Observe that the range setting is adequately small.
3. Fine adjust T802 to simultaneously minimize pulse type buzz noise on both main and sub channels. (See Fig. 3-11-8.)

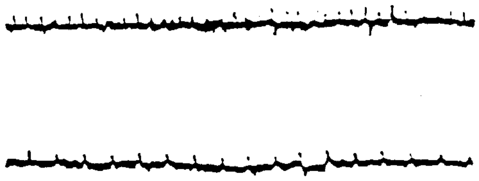


Fig. 3-11-8 LLD buzz

3.11.11 Stereo Output Level

1. Set the pilot signal for the stereo mode.
2. With the R channel unmodulated, provide 1 kHz 100% modulation on the L channel. Adjust R853 for −17 ± 0.5 dBs L channel output at connector 41.
3. Similarly, with the L channel unmodulated, provide 1 kHz 100% modulation on the R channel. Adjust R852 for −17 ± 0.5 dBs R channel output at connector 43.

3.11.12 Audio Multiplex TV Signal Generator

Recommended Specifications

1. Signal Format	Based on CCIR-B	
2. Frequency		
Video Carrier Fv	38.9 MHz	
1st Sound Carrier fs_1	33.4 MHz	
2nd Sound Carrier fs_2	33.1578125 MHz	
3. Modulator		
Video	Crosshatch (black on white) V: 50 Hz; H: 15.625 kHz	
Audio	Sinewave 1 kHz; CH-1 and CH-2 outputs switchable	
4. Output	97 dB/µV (open) ± 2 dB fixed, BNC-R 75 Ω	
5. P-S Ratio	S_1 P − 13 dB ± 2 fixed S_2 P − 20 dB ± 2 fixed	
6. Modulation		
Video	87.5% ± 3%	
Audio	±30 kHz ± 2 kHz	
7. Stereo Separation	Less than −40 dB	
8. Pilot Signal		
Carrier Frequency	54.6875 kHz ± 5 Hz synchronized type	
Stereo	117.5 Hz AM 50%	
Dual	274.1 Hz AM 50%	
9. Sound Modulation Modes	S_1	S_2
Mono	Mono 1	Mono 2
Stereo	(L + R)/2	R
Dual	Mono 1	Mono 2
10. Functions	S_1	S_2
Mono (M)	100%	100%
Stereo (L, R)	(L + R)/2	R
(L)	L/2	–
(R)	R/2	R
(OFF)	–	–
Mult (S_1, S_2)	100%	100%
(S_1)	100%	0
(S_2)	0	100%
(OFF)	0	0
V. MOD (ON/OFF)		
11. Frequency Accuracy	Within $\pm 5 \times 10^{-5}$	
12. Spurious	Less than −50 dB	
13. Saw Filter	Self-contained	